MAY 10, 1924

THE RUBBER AGE

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THE RUBBER AGE

The Only Twice-a-Month Rubber Publication

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BRUSSELS RUBBER SHOW VISITED BY THOUSANDS

But Trade Did Not Consider it Equal in Interest to 1921 London Exposition — Lacked Strength in Manufacturers' Sections.

The Sixth International Rubber Exhibition, which opened in Brussels on April 1 and continued until April 16, proved of interest to thousands of visitors in spite of the fact that members of the rubber trade who had attended previous exhibits of the kind did not regard it as equal in organization or interest to the 1921 Exhibition held in London. The Sixth Exhibition enjoyed a good location in the Hall de Cinquantenaire, Brussels, and was operated in conjunction with the Fifth Commercial Fair of Brussels. The latter event attracted many thousands of visitors who took the opportunity to visit the Rubber Exhibition. During the first days of the Exhibition, the visitors were of a general sort, drawn largely from Brussels and nearby territory and without special interest in either raw or manufactured rubber. The later days of the Exhibition produced evidence of a deep interest on the part of rubber traders from all of Europe.

Like previous Exhibitions, reports P. L. Palmerton, Chief of the Rubber Division, Department of Commerce, the present show lacked strength in the sections which should have been occupied by rubber manufacturers. As this condition is a regular one and was anticipated by the management, the scope of the Exhibition was broadened to include tropical products other than rubber and some of the most interesting exhibits were accordingly those showing woods, fibres, vegetable oils, ores and gums from all the major tropical territories.

The most prominent displays in the Exhibition were those of the Rubber Growers' Association of London which regularly takes the leading part in promoting the International Rubber Exhibitions. In their space was shown exhibits of various kinds of plantation rubber from Malaya and Ceylon, samples of rubber goods manufactured in those countries, and models of rubber plantation structures. The Rubber Growers' Association also exhibited the samples of rubber which won prizes in their competitions which have just closed. Perhaps the most interesting part of the Rubber Growers' Exhibit, however, was the Propaganda Section, where a collection of articles illustrating new uses for rubber was shown; most prominent among these articles was the crepe rubber sole. Mats and a varied array of useful articles for the home were also to be seen.

The salons allotted to the exhibits from the Netherlands East Indies, Brazil and other tropical territories also contained interesting displays of raw rubber from wild and planted areas.

Among the stands showing manufactured rubber goods, the most complete were those of the Belgian manufacturers, all of whom are represented. The most impressive of these displays were by Engelbert and Jenatzy, although other Belgian manufacturers had an assortment of products of great interest.

One American manufacturer of rubber sundries and specialties had an attractive exhibit which was placed and attended by the British distributor of the products. This was the only individual showing of American rubber goods. Other American rubber products were attractively displayed in the three salons occupied by the Rubber Association of America, Inc. To the Association display a large number of American manufacturers had contributed products, but everything was shown without identification as to the individual manufacturers. All company names had been buffed from the various

(Continued on page 90)

NAVY PLANES MAKE RUBBER SURVEY IN CARIBBEAN

The Department of Commerce has initiated investigations of possible sources of rubber supply that would be easily accessible and available for domestic demand by utilizing two airplanes from the Naval Air Station at Coco Solo, C. Z. The U.S.S. Curlew and these planes with representatives of the Department of Commerce recently completed a survey of areas comprising low swamp lands in the vicinity of the Gulf of Darien. The aerial survey completed in several day's work that which would ordinarily have required several months.

RUBBER ASSOCIATION ACTIVE IN APRIL

Sundries Manufacturers' Division Discusses Problems—Tire Division Meeting Postponed — Service Managers Confer at Cleveland on Standard Warranty.

The Executive Committee of the Rubber Sundries Manufacturers Division met at the Union League Club, New York City, on Tuesday evening, April 1. A slight change was made in the plan by which rubber sundries manufacturers for the past several years have registered with the Association office the trade names adopted by them to designate specific products in order to avoid the duplicate use of such names by members of the Division. The plan has been very effective in obviating the possibility of confusion arising in the trade through the duplicate use of specific names by rubber sundries manufacturers.

A general discussion took place on the importation into the United States of foreign made rubber sundries, its effect upon the domestic industry and the possibility of making effective the Anti-Dumping Act to improve the situation. Considerable information secured by the Association office on this subject will be turned over to the Anti-dumping Unit of the Customs Information Exchange for its attention and as of assistance in investigating this matter. The Sundries Executive Committee approved a standardization plan with respect to sizes, colors, packing, etc., for bathing slippers, which was recommended by the Bathing Slipper Committee of the Division.

The Executive Committee approved in general the suggestion that some cooperative educational publicity work be undertaken relative to the use of water bottles, etc., in the home. This question is to receive further consideration at the next meeting. It is expected a concrete proposal in connection with this educational campaign will be ready for attention at that time.

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The Traffic Committee of the Rubber Association held its regular monthly meeting at the Yale Club, New York City, on April 7 and 8. On April 8, the Committee also appeared before the Consolidated Freight Classification Committee

(Continued on page 89)

FIRESTONE BALLOON LECTURES SUCCESSFUL

Tire Dealers Throughout Country Manifested Great Interest in Traveling Demonstrations which Covered all Important Centers.

Beginning last February with a conference at the Hotel Plaza, New York City, experts of the Firestone Tire & Rubber Co., have covered the important centers of the country in an effort to instruct tire dealers and automobile salesmen on balloon tires. Although the Firestone company has maintained contact with dealers from the inception of balloons, one of the most practical sales stimulants yet used has been the branch conference.

The object of these meetings was to educate the dealers on Firestone products, explain to them how they are made, and point out the important selling points, so that they were able to answer all questions put to them by interested automobile owners. It was natural for balloon tires to occupy the center of the stage at these meetings because few improvements have even approached the interest taken by the public in tires of this type in all the history of the industry. Firestone's experience with balloons in two years of testing work, enabled its representatives to give dealers all the information they desired and to anticipate the questions the prospective customer would ask.

These discussions finally took the form of a long list of questions and answers. In addition to the technical points such as clearances, gear ratios, breaking efficiency, etc., detailed information was given on the application of balloon tires to all present makes and models of cars. The construction of the tires was not only covered in detail but demonstrated with actual cut-down sections. There was also an exhibit and explanation of the Firestone Gum-Dipping process.

Many Firestone dealers since these meetings have proved that there are good profits in selling balloons. The company's program of five sizes for all makes and models of cars, permits the dealer to carry a small stock with a comparatively small investment. To simplify changeover work, Firestone has supplied dealers with a special changeover unit for all cars.

Montgomery-Ward to Make Tires

According to Theodore F. Merseles, president of Montgomery-Ward & Co., Chicago, Ill., a large mail order firm, the company contemplates the erection of a tire plant in the near future on the Pacific Coast. Although a definite site has not as yet been selected, it is thought the plant will be built in either San Francisco or Oakland, Cal. Four manufacturers now supply the company with the 700,000 tires it annually sells, said Mr. Merseles. The firm claims to be the largest retailer of tires in the United States. The factory under consideration will manufacture tires to be distributed only on the Pacific states.

RUBBER COMPANIES JOIN BILLBOARD CRUSADE

Four rubber companies, namely the Kelly-Springfield Tire Co., the B. F. Goodrich Rubber Co., the Hood Rubber Co., and the Ajax Rubber Co., have joined the movement to eliminate unsightly advertisements on scenic highways. W. L. Lawton, chairman of the national committee for restriction of outdoor advertising, is the authority for the statement that the signs of these companies, which constitute a defacement on motor highways, will be removed as soon as current contracts expire.

St. Louis Dealers Organize

At an organization meeting of the Associated Tire Dealers of St. Louis held April 10 at the Claridge, St. Louis, Mo., A. P. Woehrle, president of the Beverly Rubber Co., was elected president. Other officers elected were Samuel L. Chlorins, vice president; Harry F. Schollmeyer, secretary; and Clarence V. Quinn, treasurer. Directors include Arthur A. Guenther, Joseph W. Kummerle, Thomas F. Carpenter, and O. R. Raith.

The principal address of the evening was made by G. A. Waddle, manager of the Dealer Relations Department of the Goodyear Tire & Rubber Co., Akron, Ohio.

U. S. Rubber Directors Elected

At a recent annual meeting of the United States Rubber Co., held at its offices on Little Burnet St., New Brunswick, N. J., two new directors, Mathew C. Brush of New York City was elected to replace Frank A. Vanderlip, and Sir Charles B. Gordon of Montreal was chosen to replace Sir Mortimer Davis of Montreal. Both Mr. Vanderlip and Sir Davis resigned.

The other members of the board are James S. Alexander, New York City; Walter S. Ballou, Providence, R. I.; Nicholas F. Brady, Middleton S. Burrill, Newcomb Carlton, all of New York City; James Deshler, New Brunswick; John W. Davis, James B. Ford, Francis L. Hines, Ernest Hopkinson, all of New York City; Henry L. Hotchkiss, New Haven, Conn.; Lester Leland, Boston, Mass.; Samuel L. Nicholson, Providence, R. I.; Homer E. Sawyer and Charles B. Seger, both of New York City.

C. B. Seger, chairman of the board of directors, told the stockholders that the quarterly dividend on the preferred stock had been earned by a good margin, after all charges and reserves for depreciation had been made.

Mr. Seger emphasized the fact that United States Rubber is not exclusively a tire company, but that it does a general rubber goods business including a full line of mechanical goods, hose, belting, water-proof and canvas footwear, clothing, insulated wire, elastic thread, druggists' sundries, the volume in tires and tubes constituting less than one-third of the total.

He pointed out, the company conducts a large merchandising business through a chain of fifty branch stores. The problem of future earning power, he explained, is confined to the tire business.

On April 17 the directors met at the company's offices in New York City and re-elected all officers for the ensuing year.

POWHATAN SUPERCORD TIRE CHARTERED FOR $1,000,000

The Powhatan Supercord Tire Corp., Norfolk, Va., has been chartered with an authorized capital stock of $1,000,000 to manufacture tires, and has acquired two buildings constructed in 1921 for use as a plant. Arthur P. Jones is chairman of the board of directors. The officers are: G. W. Land, president; William B. Blodgett, vice president and general manager; and H. Barghausen, treasurer. In addition to Mr. Jones and the officers, J. P. Todd and R. B. Grumlich are included in the board.

The new corporation has taken title to two buildings opposite the Ford plant in Newton Park, Norfolk, formerly owned by a company controlled by Mr. Jones. Approximately 60,000 feet of floor space is available for manufacturing purposes in these buildings. One of them, 231 by 80 feet in size, is now being equipped. Actual production is expected to be begun in about six months, according to Mr. Blodgett, vice president.

Ravenna in Receivership

Upon the application of M. B. Clark, common pleas Court in Ravenna, Ohio, recently appointed W. J. Beckley, an attorney, receiver for the Ravenna Rubber Products Co., manufacturers of rubber balls. The company failed after suspending operations some time ago. It was organized, said Mr. Clark, with an authorized capital stock of 250 shares of 8 per cent preferred stock of $100 par value. $49.000 of this was issued and is now outstanding, in addition to $1,500 of common stock. Mr. Clark further averred that the company has an indebtedness of $13,000, and claimed that the company failed in successful operation solely because of its inability to operate on an extended scale due to insufficient capital. Mr. Clark, who is a member of the Board, said he believed the company to be solvent but in danger of insolvency.

Silurium Sells to Aetna

The plant of the Silurium Co., manufacturers of rubber battery boxes, at Ashtabula, Ohio, has been sold to the Aetna Rubber Co., of Cleveland. It has been placed in operation with a force of 40 men after being closed for approximately one year. It is planned to operate the plant as an auxiliary to the Cleveland plant of the Aetna company in which rubber gloves for high-tension electrical work, insulated wires, battery boxes and similar hard rubber goods, are manufactured. Aetna keeps 300 persons busy in its Cleveland plant. C. J. Dunne will manage the Ashtabula plant.

C. B. Seger Leaves for Coast

C. B. Seger, chairman of the Board of the United States Rubber Co. and of the Canadian Consolidated Rubber Co., Ltd., left New York on April 20 for California. Mr. Seger expects to remain on the Pacific Coast until June.

FALLS RUBBER TO TEST PAVING BLOCKS

Plans now under consideration by Dan H. Miller, service director, and officials of the Falls Rubber Co., Cuyahoga Falls, Ohio, to lay a strip of rubber block paving on S. Front St. where traffic is extremely heavy, recalls the fact that this company began experiments with paving of this type about thirteen years ago. Rubber blocks to match the wood blocks replaced were laid on a bridge across the Cuyahoga River. After eleven years these rubber blocks showed wear of 1/8" in comparison to wear of 3/4" shown by wood blocks. The blocks were then removed to the factory to be used in unusually heavy service.

According to an official, tests made by the Falls company thus far show that rubber blocks outlast three sets of wood blocks. The methods of laying vary, however, and there is still room for considerable development work. The ability of the rubber block to stand up under hard punishment by heavy loads is due to the fact that its construction and compounding allow it to flex. Rubber blocks are practically immune to water and sand, and if properly laid, constitute an almost permanent improvement to any community.

Because of comparatively small production, the cost of rubber paving is at present higher than that of wood, but, it is said, nothing stands in the way of the development of paving of this type except possible failure of county and state highway commissions throughout the country to give it consideration.

Wuchter Joins Studebaker-Wulff

W. W. Wuchter, formerly president and general manager of the Nebraska Tire & Rubber Co., Omaha, Nebraska, has joined the Studebaker-Wulff Rubber Co. as sales manager. On January 28 last Mr. Wuchter was elected president and general manager of the Sound Rubber Co., Tacoma, Wash., but resigned some eight or ten weeks later.

For the time being he will make his headquarters in Omaha and will give particular attention to the development of sales West of the Mississippi. Sales of the Studebaker-Wulff company are said to be rapidly expanding. At this writing production was running about 1000 tires, 1500 inner tubes, and 15,000 trouser belts per day.

Balloon Class Graduated

The first class to study balloon tire repairing has been graduated from the Goodyear Tire Repair school at Akron, O. This new course was recently added to the list of subjects taught in the school for tire repairmen.

One of the oldest of its kind in the country, the Goodyear school has graduated several thousand students since it was launched to give dealers an opportunity to learn practical tire repairing.

Students from Sweden, India, Holland, Africa and the Dutch East Indies and other parts of the globe have received diplomas from the school.

IMPORTS OF LATEX INCREASING

Imports of liquid latex are increasing rapidly; of late the shipments to this country from the Far East have been as high as a quarter of a million gallons a month. The United States Rubber Co. is reported to be one of the chief importers of liquid rubber for use in impregnating cotton fabrics in manufacturing tires. Practically the entire production of this company's plantations in Sumatra and the Malay Peninsula is now being shipped to the United States in the form of sprayed rubber. In addition, the company has contracted for the entire latex production of a number of other large estates in both Sumatra and Malaya.

Haynes Adopts Balloon Tires

All models of the Haynes car are now equipped at the factory with 33 x 5.77 balloon tires instead of the 32 x 4½ high-pressure types formerly used. The change was put into effect on April 1.

To Make Rubber Flooring

The Reinforced Rubber Flooring Corp. recently filed articles of incorporation, which name Walter R. Stone, former mayor of Syracuse, N. Y., as president of the firm. Other incorporators are Raymond L. Caldwell and Stanford Skinner. It is expected that the company will locate its plant at Syracuse, N. Y. and use waste rubber from the Syra-Cord Tire & Rubber Co. plant to manufacture the flooring under the patents of Samuel G. Rigdon of Perea, Ohio. The company is capitalized at 1,000 shares of common stock of no par value.

CANADIAN CONSOLIDATED REPORTS GOOD YEAR

The Canadian Consolidated Rubber Co., Ltd., of which C. B. Seger, chairman of the board of the U. S. Rubber Co., is Chairman, experienced in 1923 the best year of any since the beginning of the depression of 1921. The company turned a deficit of $781,876, shown after preferred dividends a year ago, into the substantial surplus of $696,044, which is equal to 24.8 per cent earned on the common capital. Sales for the year totaled $14,590,434 in comparison with $13,221,575 in 1922, a gain of over 10 per cent. Net working capital stands at $6,313,345, current assets total $6,872,104 and current liabilities $558,759. Inventories have been reduced from $5,386,019 to $4,626,289.

At the annual meeting at Montreal, Quebec, two new directors were elected, namely, Ross H. McMaster, vice president of the Steel Co. of Canada, and Col. Allan A. McGee.

Daum Pennsylvania Manager

George W. Daum, assistant general manager of the Pennsylvania Rubber Co., has been elected general manager, the position held by the late Seneca G. Lewis. The Board of Directors took this action at a special meeting held at Jeannette, Pa. on April 21. Mr. Daum has been associated with the Pennsylvania company since 1909. Not only has be been a vice-president since last November, but he has been steadily promoted, holding successively the positions of cost manager, assistant superintendent, superintendent, production manager and assistant general manager.

Ott Rubber on Full Time Basis

Operations at the plant of the Ott Rubber Co., Dubuque, Iowa, are in full blast with a daily production of 2,000 tubes. Orders are said to be on hand to keep the plant, which specializes in the manufacture of tubes, busy for the next three months. The company is capitalized at $300,000 and owns sufficient land to permit considerable expansion. The daylight plant pictured above measures 220 by 90 feet. Joseph J. Ott is president; Frank E. Ott, secretary and treasurer; and Arthur W. Ott, plant superintendent.

Fire at Edge Rubber Plant

Heavy losses were recently sustained by the Edge Chemical & Rubber Co., in a fire at its plant in Houston, Texas. The factory is one of a group of brick buildings on the corner of Eagle and Fannin Sts. Explosion of a chemical set fire to 3,600 gallons of gasoline contained in six tanks. Thirteen firemen, including the captain of the fire company, were slightly injured.

Trenton Products Exhibited

Products of several Trenton rubber plants were exhibited at the Trenton-Made Products Exhibit of the Trenton Chamber of Commerce at Atlantic City, N. J. over the Easter season and succeeding weeks. Among the rubber products exhibited on Central Pier were those manufactured in the Trenton plants of the Acme Rubber Manufacturing Co.; the Ajax Rubber Co., and Hamilton Rubber Manufacturing Co.

Buckeye Rubber Elects

At its recent annual meeting the Buckeye Rubber Co., Willoughby, Ohio, elected the following officers: J. Edward Weit, president and treasurer; M. J. Rentschler, vice president; C. Edward Hyke, general manager and assistant treasurer; and W. D. Wilkins, secretary. In addition to the officers the directors include Judge Rockwell and Mr. Arter.

Chemical Show News

From present indications the Tenth Exposition of Chemical Industries, to be held at Grand Central Palace during the week of September 28 to October 3, 1925, will be successful for all space on the main floor available for exhibitions has already been contracted for by chemical and chemical equipment companies.

Scrap Rates Approved

Rates on scrap rubber, on the basis of commodity rates on scrap metal, from Southwestern points to Virginia cities, Ohio River and Mississippi River crossings have been approved by the Southern Freight Association. Information as to the date these rates become effective may be obtained from individual carriers.

Dumping Duty on Hose Imported into South Africa

According to a recent report of the Department of Commerce, rock drill, water and air hose; delivery hose, viz., acid, beer, steam, sand blast, etc.; suction hose, rough and smooth bore, including wine and spirit-proof hose; and railway hose, viz., vacuum, tender feed, car steam heating, washout and engine spray, which previously had been imported into the Union of South Africa from the United States at F.O.B. export selling prices that were less than those at which the same goods could be sold for home consumption in the United States, the Governor-General at Johannesburg has declared a special customs duty (dumping duty) equal to the difference between the selling price to the importer and the price at which the goods are sold for home consumption plus the F.O.B. charges. It is provided that the special customs duty shall not in any case exceed 25 per cent ad valorem.

Wm. C. Smith Dies Suddenly

The many friends of Wm. C. Smith learned with regret of his death suddenly on March 27, from heart failure.

Mr. Smith was president of the Wm. C. Smith Rubber Company of San Francisco, operating warehouses at that point, as well as at Spokane, Seattle, Portland, Salt Lake City and Los Angeles.

Born at Oxford Ford, N. C. September

Wm. C. Smith

15, 1872, Mr. Smith came to the Pacific Coast at the age of 17 years, locating at Spokane, Wash. In 1902 he entered the rubber business with the Washington Rubber Company, where he remained until July 1910, at which time he formed the Wm. C. Smith Rubber Company. While with the Washington Rubber Company he was closely identified with the early pioneering of auto tires and tubes, introducing the products of the Diamond Rubber Company.

Being quick to grasp the rapid development of the Pacific Coast cities and seeing an opportunity in growing communities to specialize in garden hose and other lawn goods, he embarked as a specialist in these particular lines and his later years have been devoted to promoting garden hose and kindred goods, and he was justly credited with being one of the best posted men in this branch of the rubber industry.

Mr. Smith is survived by his widow, who as active partner in the capacity of secretary and treasurer of the company has been untiring in her efforts to bring about the success of their business.

Brunswick-Balke Shows Profit

Net profits of $2,513,949 are reported for 1923 by the Brunswick-Balke-Collender Co. in comparison with profits of $2,585,579 in 1922. After allowance for dividends on the preferred stock, the company reported a balance equal to $17.63 a share earned on the $12,375,000 common stock, against $18.17 a share in 1922. The profit and loss surplus on December 31, 1923, amounted to $8,839,576. Brunswick-Balke's tire plant is located at Muskegon, Mich.

American Zinc Removes

On April 25th the New York office of the American Zinc Sales Co., distributors for the American Zinc, Lead & Smelting Co., were removed from the Equitable Bldg. to the Prudence Bldg., 331 Madison Ave., New York City.

Other offices of the company are located in Columbus, Ohio, and St. Louis, Mo. Warehouse stocks are kept in a number of cities, namely New York, Boston, Montreal, Philadelphia, Cleveland, Cincinnati, Toledo, Indianapolis, Louisville, Chicago, St. Louis, Omaha, Dallas, New Orleans and Trenton. The zinc oxide plants of the American Zinc, Lead & Smelting Co. are located at Hillsboro, Ill. and Columbus, Ohio.

Hoblitt and Ajax Director

F. M. Hoblitt, vice president and general manager of the Ajax Rubber Co., was elected a director to succeed L. P. Destribats, resigned, when the stockholders of the company met recently. At a meeting of directors later Edward L. Fries, secretary-treasurer, was appointed a vice president.

Pneu-Mechanic Co. Formed

The Pneu-Mechanic Tire Company has been organized at Thomasville, N. C. to manufacture a tire invented by Capt. W. J. Flynn, Washington, with the following officers: Charles R. Thomas, president; A. H. Ragan, secretary and treasurer; and Captain Flynn as general manager. As yet no site has been selected for the plant but a few of the tires have already been manufactured for demonstration purposes.

Goodrich Agents Confer

Representatives of the B. F. Goodrich Co. in the Carolinas, with Charlotte, N. C. as headquarters, held a conference recently at the Charlotte Hotel. L. H. Diehl, manager of the territory, presided at a meeting which was attended by agents for the company from various centers in the Carolinas territory.

Prints Book on Standardization

An interesting twenty-four page booklet called "Standardization—what it is doing for industry" has been published and is being distributed by the American Engineering Standards Committee, 29 West 39th St., New York, N. Y., which describes how standardization is being carried on, first in the individual plant, second in industry as a whole, third nationally on an inter-industrial basis, and fourth, internationally. Readers may secure a copy by writing to the A.E.S.C.

Hope for Greatwestern

According to Ted Foglestrom, general manager of the almost dormant Greatwestern Tire & Rubber Co., Centerville, Iowa, a meeting of stockholders is to be called in the near future to consider a proposition which, it is understood, will soon be made by another tire manufacturer. No details are yet available.

RUBBER ASSOCIATION ACTIVE IN APRIL

(Concluded from Page 85)

in connection with the ratings on various rubber articles. The Traffic Committee accepted an invitation from the Maritime Association of the Boston Chamber of Commerce to hold its regular May meeting in Boston on May 20 and 21. The Maritime Association is anxious to have the Traffic Committee fully informed as to Boston's facilities for handling import and export traffic. The Committee will also have an opportunity to become better acquainted with the rubber industry conditions in the Boston district.

The carriers in Middle-Atlantic territory soon will propose to the Interstate Commerce Commission that it institute a general investigation of the class rates applying within Trunk Line territory as well as between that territory and New England and Central territories. This investigation promises to be one of the largest rate cases that has been before the Interstate Commerce Commission and is of much interest to the rubber industry because of its probable effect upon the transportation charges applicable to both raw materials and finished products. The Traffic Committee is actively following developments in this matter and will keep in close touch with it until the Commission's final disposition of the investigations.

• • •

The regular monthly meeting of the Tire Executive Committee and the regular quarterly meeting of the Tire Manufacturers Division have been postponed until a date and place to be announced later.

• • •

The Executive Committee of the Board of Directors met at the Lotos Club, New York City, on April 17, when consideration was given to matters of a routine nature concerning Association activities.

• • •

A meeting of the Service Managers Committee was held at the office of the Tire & Rim Association, Cleveland, Ohio, on April 3 and 4, when detailed consideration was given to ways and means of making effective on May 1 the revised Standard Tire Warranty which requires that claims for defects in workmanship or material be presented within 90 days from date of first road wear. Consideration was also given to the display poster it is proposed to distribute to tire dealers in connection with the revised Warranty, as well as letters to tire manufacturers and tire dealers explaining the revised Warranty, the reasons for its adoption, the benefits which should be realized from it and the most effective way of handling adjustments under it.

The next meeting of the Service Managers Committee, which will be held at the Hollenden Hotel, Cleveland, Ohio, on May 6, beginning at 10:00 A. M., will be in the nature of an adjustment conference on the new 90 day warranty for pneumatic tires, to which will be invited the representatives of all members of the Tire Manufacturers Division.

GOODYEAR III WINS ELIMINATION RACE

W. T. Van Orman, piloting the Goodyear III, the entry of the Goodyear Tire & Rubber Co., with his aid, C. K. Wollam, on April 25 won the national balloon elimination race. They came down near Rochester, Minn., approximately 1,100 miles from the starting point, San Antonio, Texas, where the race began April 23. The winner fell approximately 73 miles short of the American distance record of 1,172.9 miles established in 1910 by W. R. Hawley. Captain H. E. Honeywell, piloting the entry of the Kansas City Co-operative Club, was second, and Major Peek, piloting an army bag, S-14, was third. Seven balloons competed in the race.

W. T. Van Orman C. K. Wollam
Goodyear III Pilot and His Aid

There will be brief talks by General Manager Viles of the Association, Chairman Duncan of the Tire Manufacturers Division, Chairman Sorn, and several members of the Service Managers Committee regarding the different phases of the revised Warranty, methods for making it effective and how to enlist dealers' support. Responses received from members of the Tire Manufacturers Division indicate that there will be a large attendance at the conference and that tire manufacturers are keenly interested in the activities contemplated by the Service Managers Committee in connection with the inauguration of the revised Warranty.

California Goodyear Profits

Profit and loss account of Goodyear Tire & Rubber Co. of California for the year ended Dec. 31, 1923, shows net profits of $1,743,221 after all charges are deducted. Current assets at Dec. 31, 1923, amounted to $8,798,199 and current liabilities were $706,037, leaving net working capital of $8,092,162.

Report for the 1923 year follows:

Sales	$14,444,090
Cost of goods sold, expenses, etc.	13,078,762
Gross earnings	$1,365,328
Miscellaneous income	105,622
Operating profits	$1,470,950
Profit on sale of land	951,032
Total income	$2,421,982
Interest	332,921
Federal income taxes	215,663
Deferred charges	130,177
Net profits	$1,743,221

Rubber for Hospital Streets

The Women's Civic League of Baltimore, Md., has begun a campaign to eliminate the noise about the city's hospitals caused by street car and motor traffic. The League believes that rubber paving would eliminate almost all of this noise. "The street may be paved with rubber, both between the car tracks and from the tracks to the gutter-line," they say. "The great quantity of old tires may be manufactured into rubber blocks. The car tracks can be laid on long rubber sleepers over the wooden sleepers now used."

Markets New Belt

The Security Rubber & Belting Co., Chicago, Ill., has put on the market a new type of belting with a flexible center that compensates for the crown in pulleys used for power transmission. Early in 1920 this company began to experiment with a belt of this type, and found after a year that the idea was a practical one and that the rubber belting rendered as good, and, in many cases, better service than previous belts used for the same purpose.

Small Fire at Kelly Plant

A small fire recently damaged a portion of the second floor of the plant of the Kelly-Springfield Tire Co. in Akron, Ohio.

Vacuum Tube May Lease Plant

Representatives of the Vacuum Tube & Tire Co., Pittsburgh, Pa., recently inspected the plant of the Columbia Tire & Rubber Co., Youngstown, Ohio, with a view to leasing the property. It is thought likely that Columbia should rather make disposition of the property than operate it in conjunction with its plant in Mansfield, Ohio.

BRUSSELS RUBBER SHOW VISITED BY THOUSANDS

(Concluded from Page 85)

products and all trade marks or seals were covered with an Association seal which branded the articles simply as products of American factories. The range of products shown was as complete as the limited space allowed but all branches of the industry were represented to some extent.

The most pretentious exhibit of British rubber manufactured goods was that of the North British Rubber Company which included a wide range of articles. Special attention was given in the exhibit to "Paraflor," the rubber flooring which the company advocated as a substitute for linoleum. Another exhibit of British manufactured goods which interested the visitors was that of J. G. Ingram and Son who showed an assortment of their sundries and specialties. In the Propaganda Section of the Rubber Growers' Association exhibit there were shown many samples of British rubber goods but like the Rubber Association of America exhibit, their identity was sacrificed to the major effect.

The Pure Plantation Rubber Products Co. of London had a highly interesting exhibit of products made purely from plantation rubber. The most prominent place was given to the crepe rubber sole. Kaye's Rubber Latex Process, Ltd., of London, occupied a stand with a display of rubber latex papers and boards suitable for various purposes.

The rubber reclaiming trade was represented by the stands of two important European reclaimers, one British and one French. Various grades of reclaimed rubber were displayed, as well as an assortment of rubber goods manufactured from them.

In connection with the Exhibition, a series of conferences were held at which papers dealing with various aspects of the rubber industry were read and discussed. The present status of the plantation rubber industry was made the subject of most of the papers and members of the Rubber Growers' Association took a prominent part by outlining the British attitude on the Stevenson Restriction Act and allied matters.

Abstracts of certain of the papers will be reproduced and distributed by the Rubber Division. Likewise, the Division will issue other circulars dealing in greater detail with certain of the exhibits which have been only mentioned in this general resume of the Exhibition.

Complete abstracts of some of the interesting papers presented in conjunction with the Brussels Exhibition are to be found elsewhere in this issue.

Installs New Machines

Early in April the Electric Hose & Rubber Co., Wilmington, Del., completed the installation of 50 new machines for the manufacture of rubber hose. The new machines will double the capacity of the plant, it was stated at the time.

NEW USE FOR RUBBER!

Reports from Colombo, Ceylon, state that natives have discovered a new use for rubber! Tender young leaves from rubber trees are picked and subjected to a compressing process in which the pedal extremities probably play a large part. The mass is then stained with cochineal and treated with calcium hydroxide to change its appearance. When mixed with 50 per cent of coarse tea, the mixture is consigned to Egyptian and Persian ports as "tea."

The authorities find their hands tied because of the lack of a legal definition of tea. Even if the rubber leaf concoction was being sold in local bazaars, it is a question whether the police could stop the practice because medical men, who have tested the effects of the rubber-tea infusion, claim that the drink is not at all deleterious to health.

Passes Weevil Appropriation

The House of Representatives on April 24 passed the agricultural appropriation bill carrying an appropriation of $381,910 for eradication of the pink boll worm. Allowance of $8,860 is made for surveys to determine the actual distribution of the pest, and to exterminate the worm in areas in Mexico near the United States border in conjunction with the Mexican Government. To investigate control measures, $5,000 is appropriated in the bill. A total of $368,050 is given for surveys and inspections in Texas or other states for the detection of infestations, and to conduct control measures in territory including Northern Mexico. A sum not exceeding $200,000 of the total may be used to reimburse cotton growing states in the enforcement of non-cotton zones. No money is provided in the bill to pay for crops injured or destroyed.

Production Notes

The output of the Mason Tire & Rubber Co., Canton, Ohio, in its Kent, Bedford and Owen plants is said to be approximately 4,500 casings a day.

* * *

It is roughly estimated that country-wide balloon tire production is in excess of 15,000 a day.

* * *

The shoe division of the National India Rubber Co. at Bristol, R. I., returned after Easter to a four-day-a-week schedule. Four days lost during a shutdown in March have been made up.

* * *

Balloon tires represent approximately 20 per cent of the total production of the Firestone Tire & Rubber Co., Akron, Ohio. Firestone is now producing 5,000 balloons a day. Efforts are being made to increase this production to 7,500.

* * *

An unconfirmed report places the balloon tire output of the Goodyear Tire & Rubber Co., Akron, Ohio, in excess of 5,000 a day.

RACINE HORSESHOE TAKES REORGANIZATION STEP

Announcement was made from New York on April 21 of a unanimous decision by the Voting Trustees of the Racine Horseshoe Tire Corporation to dissolve the voting trust and place the control of the Horseshoe Tire Company in the hands of its common stockholders.

This final step in the reorganization of the tire company has been made possible by steady improvement in the net earnings. The plant has been operating at capacity since September, 1923. Profits for the past six months after interest, taxes, depreciation and all other charges have been at the rate of five and one-half per cent on the full book value of the common stock.

Coincident with the winding up of the Voting Trust, the holding corporation, for which the voting trust has functioned, also will be liquidated. All company activities will now be centered in the management of the operating company with offices at Racine. The Racine Horseshoe Tire Company is one of the older small rubber companies.

New President for G.A.R. Co.

C. Bissell Jenkins has resigned as president of the General Asbestos & Rubber Co. of Charleston, N. C. to become chairman of the board of directors. He is succeeded as president by Sumner Simpson, also president of The Raybestos Company. This change is in line with an effort to effect certain economies in the joint operation of the plant of the companies and with the desire of Mr. Jenkins to be relieved of the duties imposed on him, which due to rapid growth and increased volume, have become burdensome.

After making other changes the officers and directors of the company as now constituted are as follows: C. B. Jenkins, chairman of the board; S. Simpson, president; M. B. Barkley, vice-president and general manager; H. C. Simpson, vice-president; M. F. Judd, vice-president; E. H. Jeffords, secretary and treasurer; F. B. Gardner; John P. Thomas; R. S. Small.

In a recent statement, Mr. Jenkins said: "The plants of the company are now running on full time and also partly at night. A record volume of business has been done during the past several months and the outlook for the future is very bright."

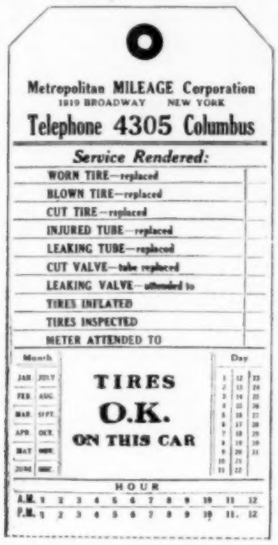
Advance Out of Receivership

According to Louis M. Kaplan, secretary of the Advance Rubber Co., Brooklyn, New York City, the receiver for the company was discharged by the Court on April 11. During the receivership a very good business was reported, he said. The plant was kept in operation with interruption and a greater volume of orders was received than had been anticipated. No changes have been made in the organization of the company or its management, concluded Mr. Kaplan.

RENTS TIRES ON BASIS OF MILEAGE RENDERED

Metropolitan Mileage Corp., in Business in Greater New York, Brings New Idea in Automotive Service to Owners of Large Truck Fleets.

The Metropolitan Mileage Corp., incorporated under the laws of the State of New York, and capitalized at $500,000, with offices at 1819 Broadway, New York City, has brought to the owners and operators of large truck fleets a new idea



Ticket Left on Cars

in tire service. No longer does the truck owner have to buy his tires, repair them, replace them. The Metropolitan Mileage Corp. rents him the tires on a basis of the mileage rendered.

In business only since July 1st last, the company has experienced great expansion, and now numbers among its customers such firms as the Corn Products Refining Co., which operates 900 cars; the Walker Gordon Laboratory Co.; Drake Bros. Co.; and almost all the big New York department stores as well as the truck fleets in the service of the newspapers of the metropolis.

When a firm subscribes to the Metropolitan Mileage service, four new tires are put on the wheels and a new spare supplied on each truck in the fleet. A sealed meter is connected to the drive shaft to register the mileage given by these tires. Regular readings of this meter are taken by inspectors, and statements are rendered monthly, computed from the mileage given, the size of the tire, and the nature of the business in which the truck is engaged. Statements are based on a rate computed per 100 miles.

Each night, trucks carrying the repairmen of the Metropolitan Mileage Corp. go to the garages where their customers cars are stored and check up on the inflations, make repairs to valves, etc. When a tire is punctured a new tube is supplied; when a casing is stone or glass cut a new tire is supplied.

Various makes of tires are used, but all are 5-ply cords. The heaviest tubes obtainable are utilized in these casings. All tires and tubes supplied are warranted new, first-grade, new stock. Replacements are of the same make as those tires supplied initially because, as Robert Edelstein, president and general manager, points out, owners of large truck fleets are as jealous of the appearance of their cars as the most finicky proprietor of a pleasure car. They take pride in their trucks, and the Metropolitan Mileage Corp. does everything possible to keep these trucks on the road, as far as the tire end is concerned. Since the foundation of the company, Mr. Edelstein says, no truck has ever been held up for an hour by tire trouble.

Many of the fleets that have availed themselves of this service express their thorough satisfaction in letters to the corporation. Sixty fleets now subscribe to the service. One hundred new tires and replacements are needed each month. Most of the tires supplied are five inches, 34 and 35 x 5, but a goodly number of Ford sizes are also used. Tires that have been vulcanized are not replaced on the cars but are left in the garages in case of more than one puncture on a truck. No payments are asked in advance but bills are rendered simply on the service given. The service constitutes a 100 per cent fool-proof tire guarantee, according to Mr. Edelstein. Savings by fleet owners are estimated at between 20 and 30 per cent.

Tuscan Plant Sustains Damage

Fire recently caused several hundred dollars damage to the plant of the Tuscan Tire & Rubber Co., Carrollton, Ohio, when the current from a broken lamp filament ignited a tank of acid used in the curing of gloves. The loss was confined to the chemical which united and the gloves that were being manufactured at the time.

Peruvian Duties on Rubber

Special Circular No. 432, issued by the Rubber Division of the Department of Commerce gives in detail the Peruvian import duties levied on rubber goods. The duties are specific, levied on a basis of gross or legal weight. Full information may be procured from the Department of Commerce.

Smith Chemical Removes

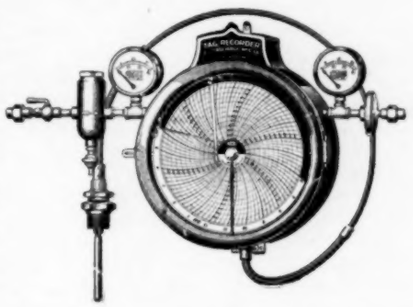
The Smith Chemical & Color Co., Inc., which for a number of years had been located at 257-9 Water St., New York City, recently removed to new quarters at 28 Moore St., a five-story building. New telephone numbers are Bowling Green 1881- 1882 and 1883. Due to greatly increased office and storage facilities the Smith company is better equipped than ever to serve its increasing clientele more promptly and advantageously. They specialize in both imported and domestic dry colors, pigment fillers and special chemicals.

Robert Badenhop Corp. Formed

The Robert Badenhop Corporation, 200 Broadway, New York City, was recently formed with Robert Badenhop, president; Murray Millenthal, treasurer; and G. Leroy Scheinler, secretary. The new corporation assumed all assets. liabilities and obligations of the crude rubber and raw products business formerly conducted by Robert Badenhop individually at 200 Broadway, New York City. Both the character of the business and the personnel remain unchanged.

Tagliabue Recorder-Controller

The C. J. Tagliabue Mfg. Co., Brooklyn, N. Y. has added to its instrument line, a combined recorder-controller. In this design an air-operated temperature controller mechanism and a recording



thermometer are mounted in the same case and are actuated by the same thermostatic system. All the structural features of the TAG Recorder such as the uniformly graduated chart, non-corrodible inverted fountain pen, pen pressure and position adjustment, improved chart holder are incorporated in this design. An important improvement is the entire elimination of the rubber connections usually employed in instruments of the combined form.

Hold Three in Robbery

In connection with the $17,000 holdup of a pay-roll car of the American Hard Rubber Co., Akron, Ohio, three confessed bandits, Nick Sinkowicz, Roy Gregick and Joseph Kadrich, are being held under $20,000 bail for the Grand Jury. The pay-roll motor was on its way from the Ohio State Bank April 16 when six men in a large touring car forced the other machine to the curb and with drawn revolvers made the American company men surrender the pouch containing the semi-monthly pay-roll. Detroit police arrested the three the following morning. A total of $10,000 was recovered.

Paul Declares Dividend

Directors of the Paul Rubber Company, Salisbury, N. C., recently declared a regular semi-annual dividend of 4 per cent on the preferred stock. It was stated that business during the month of March showed an increase of over 200 per cent as compared with the same period last year.

Andre Dubosc

First Installment of a new Series on Accelerators by Andre Dubosc, celebrated French Rubber Chemist and Engineer

Studies on the Vulcanization of Rubber – Chapter 1

By Andre Dubosc

EVER since the time that Goodyear and Hancock had the good fortune to discover the favorable effect that sulphur has on the stability and on the physical properties of rubber, the practical side of the problem of vulcanization has been settled, but the satisfactory explanation of the chemical mechanism of vulcanization still remains to be made.

The early inventors, who were simply experimenters devoid of any chemical knowledge or training, described the results that they obtained from their work, which "a happy chance of fortune" enabled them to achieve, without taking any pains to explain or investigate the matter further, in order to be able to give an exact account of what happens when sulphur in admixture with rubber is subjected to heat. They obtained commercial yields of products and were not concerned with any other phase of the problem. Hence the solution of the problem afforded was purely empirical in character and the vulcanization of rubber, which should have been an exact science, for a long time remained an art. In other words the practice of vulcanization of rubber has been something inexact, indefinite, whereat it was impossible to obtain the same results all the time and wherein the element of chance and caprice played much too often the principal role.

Early History of Rubber Vulcanization

Larwes was the first experimenter who appears to have viewed the problem in a little clearer light. Later the scientist Weber worked through the hypotheses, which were suggested, to a truely scientific basis. Weber in fact was the first one to show that sulphur saturates the double bonds of the molecule of rubber in the case of hard rubber or ebonite, or of the more or less diluted polymer in the case of the different types and qualities of soft rubber. He indicated that sulphur possesses the property of fixing the physical properties of the complex, which crude rubber is, by stabilizing them.

Although the theory advanced by Weber was of great interest, it remained incomplete for the reason that it did not take into consideration the state of polymerization of the sulphur that was employed in rubber vulcanization. Furthermore it did not explain the role that is played by the fillers and loading materials that are added to the rubber batch, such substances as litharge or magnesia. On the other hand it possessed the great advantage of fixing the different ideas expressed regarding the vulcanization mechanism and afforded a clear and tangible explanation of the stabilization of the properties of the gum.

The Art Becomes a Science

Now, inasmuch, as the nature of the chemical reaction that takes place in the vulcanization of rubber was clearly explained, and when the hypothesis advanced by Weber, subsequently corroborated by Kekule, was used as a starting point, it become possible to study the chemistry of the vulcanization process and to deduce therefrom, by instituting methodical experiments, the technical conditions which control the vulcanizing operations. The factors established by Weber were further investigated and developed until their import was absolutely fixed, and the final result was that it became possible to change the art of vulcanization into the science of vulcanization. The matter then passed from the stage of epiricism, as practiced by the foremen in the rubber mills to the state of an exact science as carried out by the chemist.

The dyeing industry, particularly dyeing in a hot dye bath or in a bath in which fermentation takes place, passed through a similar stage. The conditions were similar to those in the vulcanization of rubber, before the chemistry of the reduction of indigo by bacteria was established; before the discovery of chemical reducing agents, such as hydrosulphite and the like. In those days the woad dyer was master in the dyeing establishment and the greater or lesser success of the dyeing process depended on the quality of his art. Then science invaded this field and thanks to its fortunate intrusion, it is now possible to obtain results of a constant nature, which have heretofore been only of a haphazard character.

Ostwald Theory Not Well Founded

The theory, advanced by Ostwald, which had no real experimental work to corroborate it, states that the vulcanization process is simply an adsorption phenomenon and not a chemical reaction. Although this theory has been readily adopted by many rubber technologists, and although it has had its deterrent effect on the acknowledgment accorded the chemical theory advanced by Weber during the past few years, nevertheless the author has always considered that the latter theory was well founded. The work performed by Bysow and Stevens on the influence of nitrogenous substances and resinous matters during the vulcanization process tends to corroborate the theory first proposed by Weber that vulcanization is a chemical process.

In an investigation which Stevens made some time ago in collaboration with Beadle, it was shown that the nitrogenous substances, the protein bodies that are contained in the rubber mass, play a very important part in determining the properties that the gum attains during the process of vulcanization. The work that Baritt has done on this problem, moreover, also lends support to these new theories and ideas and shows likewise that those substances, which have hitherto been improperly considered as impurities of the rubber mass, have a very favorable effect on its properties.

It is moreover possible to say, in support of the theory advanced by Stevens that if these so-considered impurities are first extracted from the rubber mass and then the gum is mixed with sulphur and subjected to a temperature which is high enough to cause the vulcanization of the rubber, the degree of vulcanization that is obtained in this manner is rather small. Analysis of the partially vulcanized gum shows that by far the greater part of the sulphur is present in the vulcanized rubber in the free state, in such a condition that it can be removed therefrom by extraction with the aid of acetone.

In another series of investigations, Stevens has shown that the nitrogenous substances that are found mixed with the natural raw rubber, the proteins for example, play a role in the process of vulcanization which is much similar to that of a vehicle for the sulphur; in reality, these nitrogenous bodies act as catalytic agents. Under these conditions it became rather interesting to determine in what degree it was possible to substitute these natural nitrogenous constituents of the natural raw rubber by other nitrogenous bodies of foreign origin.

Quite a number of experiments have been performed to establish the influence of such substances on the quality of the vulcanized rubber. With that end in view, rubber has been prepared which is free from any trace of nitrogenous matter, the protein bodies being extracted from the gum with the aid of benzene. Plantation sheet rubber was used for this purpose. Then certain nitrogenous substances of foreign origin were added to this pure rubber.

Difficulty of Dry Mixing

In carrying out this experiment a very serious difficulty was encountered in mixing and incorporating a vegetable protein with the rubber gum by the aid of an ordinary rubber mixer, much in the same way that mineral fillers are added to the rubber batch. The vegetable proteins, when dried, were composed of very hard granular particles which it was found impossible to pulverize and comminute in a fine enough state of sub-division to be mixed with the rubber so as to give a perfectly homogenous mixture. The mixture that was obtained in this manner clearly showed streaks of the protein substance scattered throughout the sheets of gum.

This difficulty was found to be particularly aggravated in the case of vegetable albuminous substances, egg albumen and blood albumen. Fair results, however, were obtained by using Riedel's peptone which was employed in a slightly moist condition.

In order to get away from this difficulty, they resorted to another method of mixing the rubber and the vegetable albumen. This consisted in adding a benzene solution of the rubber to an aqueous solution of the protein and agitating the mixture very vigorously until an emulsion is obtained. This method allows a uniformly distributed mixture of rubber and a vegetable protein, such as casein, to be obtained. The casein solution is mixed with a small amount of ammonia in order to stabilize it.

A series of experiments were carried out with such a mixture and it was found that peptones and casein in the rubber batch facilitated the vulcanization of the rubber which had been previously freed from all vegetable proteins. Then a new series of experiments were instituted in which non-nitrogenous substances were employed as catalytic agents. Again another series of experiments were performed with the idea of determining whether or not it was possible to compensate for the removal of the natural proteins from the raw rubber by prolonging the time of vulcanization or by adding to the pure rubber, free from nitrogenous matter, substances like litharge which have a beneficial effect on the process of vulcanization.

Effect of Resinous Matter on Deterioration

Beadle and Stevens have also shown the important role that is played by the rubber resins in the process of vulcanization. The rubber deteriorated after vulcanization, when all the resinous substances, which were originally mixed with the rubber mass, were first removed.

At about the same time, in the year 1912, Weber stated that rubber, in this case smoked plantation sheet, from which all the resinous content was first removed by extraction by the aid of acetone, could not be vulcanized and he concluded from the results which he thus obtained that a minimum content of 0.3 per cent of resins was necessary in order to effect the vulcanization of the rubber.

This observation, which Weber made, confirmed in a substantial manner, the deductions that were reached by Beadle and Stevens although the latter did not subscribe to the principle that the raw rubber must contain resinous matter in order to be vulcanizable.

Beadle and Stevens, in stating that deresinified rubber can be vulcanized, remarked that after such rubber had been subjected to the vulcanization process the gum was weakened and subject to rapid deterioration. There was a similar relation between the fixation of the sulphur on the rubber and the partial decomposition of the gum; this can be readily explained.

Action of Colloidal Sulphur on Rubber

It is only the colloidal sulphur that combines with the rubber molecule during the process of vulcanization. In the absence of resinous matter, this can only be obtained during the course of the process through a partial decomposition of the pure rubber which is polymerized and changed in chemical state. The formation of water, which takes place at the same time as the evolution of colloidal sulphur, explains the necessity of the presence of an absorbent in the rubber batch. This is part played by the chalk or whiting that is added to the rubber batch. These substances also prevent the formation of porous vulcanized products.

The questions now arise in what matter can the resinous constituents of the rubber, which have been separated from it, react with mixtures in which sulphur is contained at a temperature in the neighborhood of the vulcanization temperature, approximately between 120 and 150 degrees, and what new substances are formed when such reaction takes place?

Chemical Changes in Sulphur

It is possible to say that under these conditions the total quantity of the sulphur, subjected to the high temperature, is converted onto sulphuretted hydrogen, H_2S. Hence the role that is played by the resinous constituents of the rubber during the course of the vulcanization process was to convert the sulphur that is present in the mixture into sulphuretted hydrogen.

On the other hand it is known that a rubber batch which contains oxides, such as litharge, oxide of zinc, magnesia and sulphur, when subjected to the temperature at which vulcanization takes place, between 120 and 150 degrees C, will contain after vulcanization metallic sulphides and sulphurous acid.

The latter substance then reacts with sulphuretted hydrogen, resulting in the formation of water and colloidal sulphur. This fact was observed by Payen even before Peachy.

These phenomena which have been observed in experimental studies on this subject and on which the theories of vulcanization are based, should take place in a similar manner during the course of the vulcanization process. Without actually deducting the theory which the author has just described, Stevens made the following three observations:

1. Rubber which is in the chemically pure state vulcanizes rather poorly.
2. The presence of albuminoids that are not found in the natural gum, and that are artificially added to the rubber batch facilitate the process of vulcanization.
3. Vulcanization is facilitated by the presence in the mixture of carbon compounds, which do not contain nitrogen, such as starch.

Action of Resins and Proteins in Rubber

An entire series of experiments have been instituted with the idea of determining the action of the resins and of the proteins in vulcanization and likewise to see how a rubber will behave when the resins and the nitrogenous products have been extracted at one and the same time.

Samples of such rubber have been vulcanized under a number of different conditions. The coefficients of vulcanization obtained in each case as well as the physical results secured by making mechanical tests of the rubbers were recorded. In the course of these tests two samples of the rubber were under-vulcanized while others were over-vulcanized. The treatment of the samples of rubber from the standpoint of the duration of the vulcanization and of the temperature at which the vulcanizing process was carried out was regulated in the same manner as in the case of a natural rubber which has not been deprived of its resins nor of its nitrogenous constituents. A list of the various rubbers that were tested

and the results that were obtained in the experiment are given in the table below.

Description of Rubber Samples

No. 1. Sample of rubber that has not been treated. The sample was taken from the central part of a sheet of non-smoked rubber coming from the Malayan peninsula. All the samples that were tested in these experiments were taken from the same sheet of rubber.

No. 2. Insoluble ingredients of the rubber were extracted by means of benzine in which the rubber was dissolved. The gum was recovered by evaporation of the solvent from the filtered solution.

No. 3. A part of the sample prepared as above was worked up in an ordinary mixer in such a manner as to break up the individual fibrous structure of the proteins to an indefinite degree. This was done in order to determine the effect of such a preliminary treatment of the rubber before it was vulcanized on the vulcanized products.

No. 4. The rubber sheet was dissolved in benzine; the insoluble matter derived from the rubber gum which settled to the bottom of the solution was recovered. This sample contained the insoluble matters.

No. 5. This sample was obtained by evaporating the supernatant portion of the liquor obtained in No. 4, which contains the rubber separated from its insoluble matter.

No. 6. This was made from sample No. 5 by incorporating with it three per cent of Riedel's peptone. The peptone was mixed with the rubber in the regular rubber mixer and roll.

No. 7. To the pure benzine solution which was obtained in No. 5 there was added an aqueous solution of Riedel's peptone. The mixture was emulsified. The rubber was recovered by evaporation. It need not be altogether dry.

No. 8. To the benzine solution of the pure rubber that was obtained in No. 5, there was added a three per cent solution of casein dissolved in ammonia. The mixture was then emulsified.

No. 9. To the pure rubber gum which was obtained in No. 5 three per cent of starch was added. The mixture was made between mixing rolls.

No. 10. To the purified rubber that was obtained in No. 5, there was added approximately ten per cent of litharge.

No. 11. A part of the purified rubber that was obtained in No. 5 was vulcanized for a period of eight hours instead of three hours, the duration of the heating process being tripled. The purpose of making the test was to determine if the removal of the natural resinous content of the rubber had any effect in reducing the rapidity of the vulcanization process, and also to see if it had any general deterrent action on the same.

No. 12. In this case the sample was made from rubber which had been freed of its natural resin content by allowing a portion of the rubber to remain in contact with cold acetone solution over a prolonged period of time. The resin content of the rubber was reduced in this manner from 2.5 per cent at the start to 0.2 per cent at the finish.

No. 13. This was made from No. 12. A part rubber was taken and mixed with 2.5 per cent of resins. This test was made for the purpose of determining the changes that take place in the rubber when subjected to an extraction process as outlined above.

No. 14. This sample was made with a part of the sample prepared as in No. 12. The purified rubber was mixed with 2.5 per cent of djeulutong resin. The experiment was made for the purpose of determining the effect of this particular type of resin and to see if the results obtained are any different from rubber which has been mixed with Hevea resin, in other words, the resin that is extracted from ordinary Hevea rubber. The last-named resins are saponifiable and do not possess the power of rotating polarized light. On the other hand the djeulutong resins, which are constituted of a mixture of chloresterol and chloresterol ethers, are unsaponifiable and possess the power of rotating the plane of polarized light.

No. 15. The sample obtained in 12 was mixed with 2.5 per cent resin. The purpose of this experiment was to determine the effect of rosin and other resins of similar character on the vulcanization of the rubber mixture. Particularly interesting was the comparison between the results obtained in this case and those obtained with Hevea resins incorporated in the rubber batch.

No. 16. In this case the sample was similar to No. 4. The latter contained all the insoluble matter that would not dissolve in benzine, but the sample was subjected to an acetone extraction in the cold to isolate the resins.

No. 17. The same as used in No. 5 but insoluble matter has been separated from it. It was treated with cold acetone to remove the resins it contained. Hence this sample contained only traces of proteins and resins and can be considered as a practically one hundred per cent pure rubber. It is colorless and translucid.

Mixing the Samples

All the samples of rubber described were subjected to hot mixing between rubber rolls. Seven per cent of sulphur was added to the rubber and then the latter was rolled out in the form of a sheet and subjected to ordinary vulcanization. After the vulcanized rubber samples had been allowed to remain for a week, they were given an examination to determine the physical properties. They were also analyzed to see how much of the sulphur was combined with the rubber molecule. The differences between the results that were obtained in the testing of the seventeen different samples of rubber were very marked. Just one experiment on each type of rubber was sufficient to differentiate it from all the others.

Physical Tests

Each sample of vulcanized rubber was subjected to a stretch of five times its original length. In column one of the following tabulation there are given the loads required to bring about such an elongation. The figures are in grams per square centimeter of a section cut transversely through the sample of rubber. All the samples of the vulcanized rubber withstood this test without breaking, with the exception of No. 15. This is the sample of rubber deprived of its natural resins and mixed with 2.5 per cent of rosin. The sample broke after the elongation was 3.8 times the original length.

Column 2 in the tabulation gives the deformation figures, which can also be considered as an indication of the results that are obtained in the vulcanization process. This figure is indicative of the quality of rubber that is obtained at the close of the vulcanization process, although the initial quality of the crude rubber is the same for all cases. The deformation result is perhaps the best characteristic or coefficient of the quality of the vulcanized product and the effectiveness of the vulcanization process.

Column 3 gives the coefficient of vulcanization. The sulphur that combined with the rubber molecule during the vulcanization process is determined by the oxidation method, after the free sulphur has been entirely removed by extraction with the aid of acetone.

Tabulation of Results Obtained in Testing Vulcanized Rubber Samples

Number of sample	Nature of mixture	Elongation load grams	Deformation per cent	Coefficient of vulcanization
1.	Non-treated rubber	178	25.6	2.86
2.	Rubber dissolved in benzine	182	24.4	2.84
3.	Same rubber kneaded	165	33.2	2.68
4.	With excess of insoluble matter	267	12.4	3.62
5.	Without insoluble matter	55	broken	1.15
6.	With peptone	156	20	3.22
7.	With peptone by emulsification	166	23.6	2.89
8.	With casein	106	57.2	1.76
9.	With starch	73	broken	1.42
10.	With litharge	308	8.8	3.02
11.	No. 5 vulcanized, four times as long	198	29.0	2.16
12.	Rubber without resins	213	18.0	2.71
13.	Rubber with Hevea resins	184	20.0	3.12
14.	Rubber with djeutulong resin	181	22.0	2.98
15.	Rubber with rosin	196	31.6	2.85
16.	Rubber No. 4 extracted with acetone	280	12.8	3.34
17.	Rubber No. 5 extracted with acetone (pure rubber)	66	broken	1.08

In the next installment, which will appear in the May 25th issue, Andre Dubosc discusses the results of the experiments with the seventeen samples.—The Editor.

Makes Survey of Wages in Rubber Industry

National Industrial Conference Board Compiles Data Covering 54 Plants and Five Lines of Manufacture

IN comparison with an upward tendency in employment in 22 other industries revealed by a digest of figures compiled by the National Industrial Conference Board, New York, the rubber industry showed a marked decrease according to information recently made public. Average weekly earnings in 23 industries advanced four cents to $27.20 in February, 1924, but hours of work showed a slight decline. Nearly 850,000 workers in 1700 manufacturing plants throughout the United States are covered in the survey of the Board, which is the research authority for the leading industrial associations of the country.

Based on prevailing prices, the factory worker in the industries investigated today enjoys an increase of 40 per cent in hourly earnings, and 32 per cent in weekly earnings, over the pre-war month of July, 1914. Total employment showed a slight gain of one half of one per cent between January and February. Thirteen of the 23 industries shared in this gain, in eight, including the rubber industry, employment declined, and in only one was it unchanged.

Average hourly earnings of male factory workers in the rubber industry were $.535 for January, 1924, and $.492 in February. Skilled male labor averaged $.719 in January and $.683 in February. Women employed in rubber factories earned an average of $.437 an hour in January, and $.427 in February.

Weekly earnings of factory workers in the industry showed a corresponding decerease. The average weekly wage of unskilled male labor dropped from $26.27 in January to $25.15 in February, but compared with the average of $23.43 per week in February in all other industries, it is high. Average weekly earnings of skilled labor averaged $31.75 in January and $30.54 in February, as compared with January earnings of $31.36 and February earnings of $30.73 in all other industries. Women averaged $16.82 per week in January and $15.95 in February, which, when compared with the earnings of all other industries shows a decline. In the other industries women earned $17.41 in January and $17.36 in February.

Data for the rubber industry was compiled by the board from figures furnished by 54 plants engaged in the manufacture of tires and tubes, footwear, mechanical goods, rubberized fabrics and sundries. The largest number of wage earners employed in any one month in these 54 factories was 57,195 in June, 1920. Thus, the above figures constitute 36% of the wage earners reported by the 1919 Census of Manufacturers for the rubber industry. The majority of the plants reporting are located in the large centers of rubber manufacturing, such as Akron, Ohio, and Trenton, N. J., but 13 factories located in the state of Massachusetts reported.

The geographical distribution of other plants reporting is as follows: California, 1; Connecticut, 6; Delaware, 1; Iowa, 1; Maryland, 1; New Jersey, 6; New York, 5; Ohio, 12; Oregon, 1; Pennsylvania, 3; Rhode Island, 4.

During the second half of 1923 earnings of factory workers in the rubber industry fluctuated from month to month, but

Composite and Classified Payroll Data

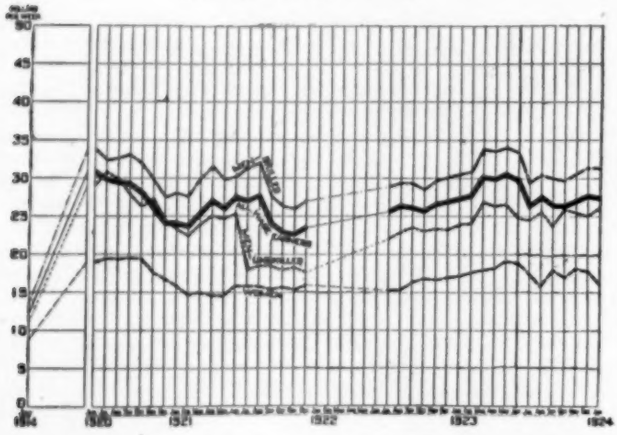
PERIOD	ALL WAGE EARNERS						MALE—UNSKILLED				MALE—SKILLED				WOMEN			
One Week In	No. Wage Earners Index Nos.	Av. Week per Wage Earner	Av. Hourly Earnings	Av. Weekly Earnings	Index Nos. Earnings Hourly	Index Nos. Earnings Weekly	Av. Hourly Earnings	Av. Weekly Earnings	Index Nos. Earnings Hourly	Index Nos. Earnings Weekly	Av. Hourly Earnings	Av. Weekly Earnings	Index Nos. Earnings Hourly	Index Nos. Earnings Weekly	Av. Hourly Earnings	Av. Weekly Earnings	Index Nos. Earnings Hourly	Index Nos. Earnings Weekly
1914																		
July..	....	*49.1*	*$.250*	*$12.28*	*100*	*100*	*$.209*	*$11.10*	*100*	*100*	*$.285*	*$13.85*	*100*	*100*	*$.181*	*$8.80*	*100*	*100*
1920																		
June..	100.0	42.8	.720	30.86	288	251	.653	29.02	312	261	.796	33.98	279	245	.444	18.96	245	215
Dec..	43.7	38 8	.621	24.06	248	196	.570	24.49	273	221	.735	27.50	258	199	.414	16.81	229	191
1921																		
Jan...	41.1	39.1	.617	24.11	247	196	.554	23.35	265	210	.729	28.10	256	203	.404	15.87	223	180
Mar .	39.9	42.7	.597	25.46	239	207	.523	24.00	250	216	.690	30.01	242	217	.380	15.05	210	171
May..	50 9	42.8	.608	26.04	243	212	.535	24.76	256	223	.682	29.83	239	215	.381	14.69	210	167
Aug..	56.2	46.5	.598	27.78	239	226	.396	18.50	189	167	.678	32.06	238	231	.364	15.83	201	180
Oct ..	53 7	44.3	519	22.99	208	187	.394	18.00	189	162	.596	26.37	209	190	.361	15.78	199	179
Dec..	54.7	45 8	514	23.53	206	192	.388	17.75	186	160	.601	27.07	211	195	.337	16.13	186	183
1922																		
July .	62.3	43.9	.584	25.64	234	209	.472	22.16	226	200	.651	28.97	228	209	.380	15.32	210	174
Aug .	59.1	44.9	.586	26.32	234	214	.478	22.96	229	207	.649	29.45	228	213	.376	15.49	208	176
Sept .	63.8	45.6	.573	26.13	229	213	.489	23.52	234	212	.637	29.32	224	212	.377	16.30	208	185
Oct .	63.8	45.1	.569	25.66	228	209	.485	23.05	232	208	.636	28.59	223	206	.379	16.86	209	192
Nov..	64.3	46.0	.577	26.51	231	216	.479	23.32	229	210	.645	29.77	226	215	.376	16.60	208	189
Dec..	65.2	46.4	.579	26.89	232	219	.489	23.29	234	210	.646	30.13	227	218	.377	16.98	208	193
1923																		
Jan...	68.3	46.3	.590	27.34	236	223	.492	23.90	235	215	.655	30.50	230	220	.389	17.27	215	196
Feb...	71.3	47.8	.580	27.77	232	226	.491	24.06	235	217	.639	30.95	224	223	.393	17.66	217	201
Mar..	74.7	47.2	.638	30.11	255	245	.541	26.86	259	242	.712	33.85	250	244	.401	17.97	222	204
Apr...	74.2	46.6	.642	29.91	257	244	.550	26.31	263	237	.712	33.66	250	243	.419	18.25	231	207
May..	72.9	46.6	.656	30.54	262	249	.547	26.52	262	239	.728	34.14	255	246	.426	19.05	235	216
June..	68.7	46.6	.668	29.76	267	242	.524	24.80	251	223	.750	33.43	263	241	.431	18.87	238	214
July..	64.3	42.0	.626	26.29	250	214	.511	24.58	245	221	.706	29.38	248	212	.427	17.49	236	199
Aug .	50.4	41.3	.661	27.31	264	222	.513	25.53	245	230	.735	30.38	258	219	.421	15.73	233	179
Sept..	58.6	43.1	.612	26.40	245	215	.522	23.69	250	213	.690	30.06	242	217	.430	17.71	238	201
Oct...	59.8	43.3	.607	26.30	243	214	.515	25.83	246	233	.681	29.80	239	215	.429	16.98	237	193
Nov .	62.5	44.2	.609	26.96	244	220	.533	25.45	255	229	.681	30.40	239	219	.428	17.92	236	204
Dec .	65.3	44.4	.620	27.53	248	224	.523	25.03	250	225	.697	31.26	245	226	.426	17.79	235	202
1924																		
Jan. .	66.7	42.8	.637	27.31	255	222	.540	26 09	258	235	.709	31.28	249	226	436	16.09	241	183

maintained a fairly high level. In January, 1924, average hourly earnings of wage earners were 63.7 cents, 8 per cent higher than in the preceding January and 155 per cent above the level of July, 1914. Women, with an increase of 12 per cent, earned the greatest gain among the classified labor groups.

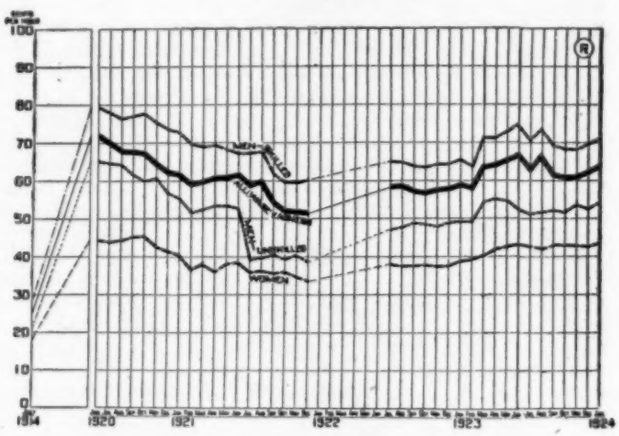
Average weekly earnings of all wage earners were $27.31 in January, 1924, three cents less than in January, 1923. Weekly earnings of unskilled male labor increased 9.2% during the twelve months ending January, 1924, male skilled earnings increased 2.6%, but the earnings of women were 6.8% less. The reduced employment and hours of work during the second half year indicate considerably less activity in the industry than during the first half of the year.

A table giving composite and classified payroll data in the rubber industry is reproduced herewith. Graphs showing the rise and fall of average weekly and hourly earnings are printed below:

Average Weekly Earnings



Average Hourly Earnings



Commercial Rubber Production in the Everglades

Ranch Company Plants 700 Seeds Imported from Java in the Rich Muck Land of the Florida Everglades for an Experiment

GOVERNMENT investigation of the possibilities of rubber production on the rich Everglades of Florida, particularly in the vicinity of Miami, has attracted not only the interest of those in the rubber industry but capitalists and agriculturists, says J. S. Rainey, county agricultural agent in Florida, who reports that inquiries from many sources are being received at his office. Since the experiments were begun January 1st at Chapman Field under the direction of Alfred Keyes, plant specialist, the Curtiss-Bright Company, Miami, Fla. have planted 700 seeds of Hevea Braziliensis, which they obtained from Java, in the rich black muck soil of the Everglades.

At this writing, although the seeds have not been planted long enough to show above the ground (as the shell is quite hard and requires considerable time to soften and sprout), they feel confident that local conditions, including the excellent sub-irrigation, is entirely suitable for the satisfactory growth of commercial rubber. According to J. A. Michael, of the Curtiss-Bright Company, wild and other varieties of rubber trees grow well in Dade County.

The Curtiss company points out that the project is purely experimental and was undertaken solely to determine for themselves the possibilities of the fertile Everglades in this direction. Should it prove successful and the climatic conditions favorable, the raising of rubber may become one of the largest industries of southern Florida. The state drainage both completed and contemplated will include a reclaimed area of approximately 3,000,000 acres of the most productive virgin land in the United States. In one part of the Everglades, which the Curtiss company calls "Cypress Swamp", there is a tract of almost solid wild rubber trees, comprising about 1400 acres.

The growing of sugar cane in the Everglades by the Pennsylvania Sugar Company is an index to the productivity of this part of Florida. On its holdings of approximately 300,000 acres of muck land along the Miami Drainage Canal, sixteen miles from Miami and seven from Hialeah, a $1,500,000. mill has been erected and successfully operated this season.

It is said that a government agent will remain on duty at Chapman Field until the subject of growing commercial rubber had been thoroughly investigated. The investigation is likely to continue over a period of years in the opinion of J. S. Rainey.

The trees planted by the Florida East Coast Railway some years ago on the Perrine land grant and in other places in Dade County have shown a wonderful growth. But this test is not sufficient to prove that commercial rubber can be grown in the Everglades; hence the experiment of the Curtiss-Bright Company is being watched with more than usual interest.

Cost Figures That Help You Sell *

Every manufacturer realizes that when his plant operates at less than capacity, the cost of his product rises. He cannot, however, raise prices to correspond with the costs. Rather, he lowers prices so as to get more work into the plant, and by enabling him to spread the overhead expense over more product to reduce his costs.

Usually the shading of prices for this purpose is done by guess work without a cost system properly designed for the purpose; if so the prices may be cut to an extent that makes the loss greater than it would be if the plant were shut down.

Informative figures can be obtained without an unduly complicated cost system. It simply requires that a normal figure for each item of expense in a department be determined based upon the normal activity of that department.

Each month the normal and actual figures are compared. Those items which fluctuate with the activity of the plant are in one group and those which do not are in another.

Knowing accurately the labor and material cost of the product it is then possible to accurately determine what the result on profits will be if a given amount of business is taken at a given price.

*By William R. Basset, President of Miller, Franklin, Bassett & Company, Inc.

Papers Read at Brussels Exhibition

Problems of the Plantation Industry — Cover Crops and Clean Weeding — Physiological Effects of Disease in Plants

AMONG many interesting papers presented at the International Rubber Conference, held in conjunction with the Sixth International Exhibition of Rubber, Other Tropical Products and Allied Industries at Brussels, April 1st to 16th inclusive, are several that we believe will be of interest. Complete abstracts of these papers are published below:

Problems of the Plantation Rubber Industry

By P. J. Burgess

Prefacing his paper with the remark that problems and difficulties can be broadly divided into two classifications, physical and psychological, the author proceeds to discuss the value and methods of manuring in the cultivation of rubber, the selection of plants, the study and control of diseases and pests, the need for precise knowledge as to the real function of latex in the life of the rubber tree, and the difficulties to be overcome in the transportation and packing of rubber in order that the material shall be kept free from dirt and extraneous substances.

A problem, which will demand solution in the near future, has its source in the small size of many of the units of the producing industry. In spite of the large number of associations formed in the interest of growers in the East, in London, and on the Continent, the essential of unity is often missed. The bond of association is a weak, voluntary one, and the organizations cannot speak for the units forming them. The writer feels that one of the biggest problems for solution is the reorganization of rubber growers in such a way as to avoid the present dissipation of strength by subdivision of units and to put the industry into such condition that it can as a single unit, or as a very few units, deal with matters such as price, propaganda, and production on a comprehensive scale in the interest of all producers. There are tendencies in this direction already observable in estate amalgamation and in other movements. Had the recent control of rubber export been attained by voluntary means through direct and close association of the producers concerned, instead of by Government action, the scheme would have been more speedy and effective and much of the opposition of the manufacturing and consuming interests would have been disarmed.

The work of the Propaganda Department of the Rubber Growers' Association is given as an instance of successful combination of interests and joint action. The peculiar difficulty in the case of raw rubber as compared with other products, that the material is consumed only as a constituent part of a manufactured commodity, makes the relation between price and quantity slow and imperfect in action, and for this reason rubber cannot be expected to respond readily to efforts made for the stimulation of consumption. To obtain cooperation between producers and manufacturers has been the aim of rubber growers for some time past, but up to the present without much success. Yet in actual experience trouble either in the rubber growers' camp or in the manufacturers' citadel has proved bad for both, without any real benefit accruing to the consuming public. But why should not rubber be open to benefit from combined publicity? The author says it should not be a problem incapable of solution to devise a way to bring all interested in rubber into cooperative harmony.

Some Physiological Aspects of Disease in Plants

By V. H. Blackman, Sc.D., F.R.S.

Professor of Plant Physiology and Pathology, Imperial College of Science and Technology, London.

The author says that though great advances have been made in the last fifty years by both animal and plant pathologists in the study of infectious disease the two branches of pathology have not advanced on a parallel front in the field of prevention and cure. In the elucidation of the nature of disease resistance and in the study of methods of prevention and cure the animal workers have far outstripped their botanical colleagues. Until recent years the physiological aspects of disease have been very largely disregarded.

The great physiological differences between plants and the higher animals are pointed out. No clear case is known of a plant acquiring immunity or resistance as a result of one attack of infectious disease, and the plant pathologist is unable to bestow immunity by an injection of a vaccine or a serum. The main work of the plant pathologist has been therefore directed to the protection of the plant from attack by means of poisonous agents, and to some extent also to the breeding of disease-resisting varieties.

In recent years, however, the physiological relations between host and parasite have received some attention. An investigation in regard to wheat-rust showed that there was no real resistance in the ordinary sense of the word, but it was found that the tissues were so susceptible to attack that they died almost immediately and so brought the invasion to an end. A more intense study of the physiological relations of host and parasite would probably reveal phenomena which might prove to be of great practical importance. Another physiological aspect of disease which requires more attention is that of the effect of environmental conditions—unsuitable temperature, drought, waterlogging of soil—producing a disease-condition for the invasion of a foreign organism. The "brown bast" of Hevea is probably in this class, the unfavorable environment being, apparently, too frequent tapping. The physiological question of the effect of environmental conditions on susceptibility to fungal and insect attack still needs investigation. Having quoted several examples of plant diseases which show a close co-relation between the physiological condition of the host and the incidence of disease, the author says that apart from the question of disease a fuller knowledge of the normal physiology of Hevea and other important tropical plants can hardly fail to improve production; and when disease is present satisfactory control is much more likely to be realized if knowledge of the physiological relations of the host plant is available.

Cover Crops and Clean Weeding

By Noel Bingley

The author at the outset declares himself a believer in Selected Weeding as opposed to Clean Weeding, and a supporter of the cultivation of Cover Crops. He acknowledges that Ceylon planters, who generally favor Clean Weeding, have made a success of their tea and rubber industries, and he examines the arguments in support of their system with which some of his Ceylon friends have supplied him, these arguments being mainly two—that the system is the cheaper, and that under it Ceylon planting has been an unqualified success. He doubts if the last word has been said on the question of economy, and quotes upkeep figures of areas under well-established Cover Crops in Java which, he says, will be hard to beat.

By Selected Weeding the writer says he means the regular eradication with the fork of all harmful weeds, and especially of all Lalang and other grasses which appear sporadically but can be reduced to a negligible minimum by systematic and regular removal as soon as they show themselves, and leaving the harmless weeds to be dug into the soil periodically. To distinguish harmful from harmless weeds is only a matter of ordinary intelligence and observation; and the difficulty of estimating and controlling the costs of the system, which one of his Ceylon friends had referred to, disappears when

once it is in hand and thoroughly understood by staff and coolies alike.

It is argued by the advocates of Clean Weeding that alien vegetation absorbs the soil's fertilizing properties, but in the opinion of the Dutch agricultural scientists the bulk of the plant food so absorbed is eventually returned to the soil and Mr. Spring, Agriculturist on the Staff of the F.M.S. Department of Agriculture, has expressed a similar view. It is suggested that the chronic erosion of soil, which is the natural result of years of Clean Weeding, is a greater danger to the cultivated plant than is the partial loss of plant food, and the author quotes an article by the Director of Agriculture in Ceylon, in "The Tropical Agriculturist" of last September, in which it was stated that soil erosion is the greatest danger that threatens Ceylon agriculture and the permanency of at least two of its staple industries. A recent report of the Ceylon Surveyor and the Director of Irrigation dealing with the same matter urges the discontinuance of Clean Weeding, and similar opinions are quoted from authorities in India and the Dutch Indies.

Several extracts are given from Dr. Bernard's paper on "Green Manuers," read before the Soekaboemi Planters' Association a year ago, to show that Soil Covers of various kinds have simply been the salvation of many rubber estates where serious loss of soil had already taken place and that the particular Cover Crops named have in their special way restored life to soils ruined by Clean Weeding. Much the same opinion has been expressed by Mr. Pinching, Senior Scientific Officer of the Rubber Growers' Association.

The author proceeds to give a detailed description of the process which takes place when nitrogenous Cover Crops are allowed to work upon the soil, and examines the manurial influence of many named varieties of Cover Plants. In concluding this part of his paper he says: "I think the fact is often overlooked that its soil is the most valuable asset an estate possesses, and that to preserve it is worth almost any sacrifice, even to the extent of the slightly retarded development of the cultivated trees, which is sometimes advanced as an objection to alien growths, though I think without much justification."

A Plan for Closer Working

By James Fairbairn

This is in the main a plea for closer cooperation of producers of plantation rubber, in two directions—restriction of production and the marketing of the commodity. The writer says it is an astonishing fact that there is so little cooperation in matters that seriously concern the producing side of the industry. Especially does the need for closer working apply to the British and Dutch.

At present a compulsory restriction scheme is operating in British Malaya and Ceylon, while in South India, Burma and British Borneo the scheme is merely voluntary. This seems illogical; British producers should put their own house in order before seeking the adherence of others, and the writer expresses the view that the Stevenson Scheme should be made legislative in those portions of the British Empire to which it does not at present apply. On the other hand he says that the policy of the Dutch planting interests, as represented largely by the financial groups in Holland, strikes the average Britisher as being one of complete selfishness. Without consideration for their senior partners, the British, these Dutch financiers have shown at the same time no regard for the good of the estates they control. It is lamentable that the Dutch financiers should do all they can to prevent British planters from reaping the fair fruits of their labor. The position is that Ceylon and Malaya have compulsory restriction, other parts of the British Empire have a voluntary scheme, and the Dutch are producing all they possibly can, the result being that the price of rubber is still round about 12½d a pound.

The second matter in which more cohesion is required is the method of selling the product. There are many sellers and few buyers, and the author urges all in the planting industry to be prepared to take steps to combine so as to meet the buyers on their own ground by getting the selling as far as possible into few hands. American buyers cannot be blamed for wishing to buy at as low a figure as possible, but producers desire to get the best price they can and they should take measures to combine all producing interests for the purpose of selling the product. He suggests that each country responsible for large production should make a combination, which in its turn should work in an international organization. Only within the last few days a proposal has been put forward in America that Congress should permit the formation of agencies for the purchasing in common of raw materials at present alleged to be controlled by foreign monopolists, and the rubber restriction scheme is mentioned in that connection. If such a combination comes into existence in America the only possible course open to the producing industry will be to combine, and the European manufacturing industry will have to do the same in order to meet unfair competition. If these two sections can combine, they can sit down round a table with a combination of American manufacturers and come to a fair and reasonable business arrangement.

Labor Forces on Rubber Estates

By N. C. S. Bosanquet

The writer expresses the belief that if the policy of the survival of the fittest among rubber producers should ever be tried the most economical work will be shown by estates with fixed residential labor, wherever the property may be situated, and that those estates which are dependent upon the whims and fancies of the Kampoeng will find the path of real economy a very thorny one. He discusses the claim of many estates in the Dutch Indies that they can work cheaper than the average estate in the Federated Malay States, and expresses the opinion that what is actually taking place on a large number of estates in Java is that the cost of producing the rubber is being cheapened at the expense of the coffee with which it is interplanted. The Census figures for British Malaya for 1911 and 1921, recording large increases in the Tamil labor force in comparison with Malaya and Chinese, appear to confirm the view of the writer that Tamils are the most desirable labor to secure for successful and cheap working on rubber estates as soon as the process of opening the land has been completed.

Only when a manager has an established resident labor force can he know how many coolies he is going to turn out every day. The only cheap system of clean weeding is a regular round, and for this purpose, as well as for regular tapping, a regular labor force is necessary. A permanent free residential Tamil labor force is the cheapest and best. In considering production costs the fact is often overlooked that cheap working depends more upon regular labor and work being kept up to date than upon whether a coolie is paid 40 or 37 cents a day. Then, the Tamil is paid to do any work for which the manager considers he is fitted, and if some particular work is behindhand the whole labor force of Tamils can be put on to it. The Java manager cannot do this, for if a Javanese is a tapper he leaves if he finds he is expected to do other sorts of work. The resident labor force which is general in Ceylon and the F.M.S. gives estates there a great pull over the estate employing labor from the Kampoengs in the efficiency with which the medical arrangements can operate, and the death-rate figures for 1922 were most encouraging to those who advocate the former system.

In the course of a comparison between the labor conditions of Ceylon, the F.M.S., and the Dutch Indies the writer praises the system adopted in the two first-named countries of giving head-money to Kanganies, and notes that a feature on every estate is the number of children working in the field. This has much to do with the efficiency of the Tamil coolie in Ceylon, as he is trained as a child and gradually becomes expert in all departments of estate work.

Accountancy in the Rubber Plantation Industry

By J. G. Hay

The author introduces his paper with the remark that from the first the rubber industry has adopted and maintained a practical and effective costing system, and in that respect has shown to advantage over some of the older forms of agriculture, in which primitive and haphazard methods of

(Continued on Page 100)

Rubber Chemists Meet in Washington

Interesting Papers Read at Meeting of Rubber Division of A.C.S. — Two Committees Report — Dinner-Smoker Held

OVER 150 members of the Rubber Division of the American Chemical Society were present at the well-attended Annual Spring meeting held in Washington, D. C. on April 23-25. The meeting was devoted to the presentation of a number of papers on Wednesday, Thursday and Friday mornings and Friday afternoon was taken up with reports of the committees on Physical Testing Methods and Crude Rubber Testing.

On Thursday evening a dinner-smoker was held at Harvey's Restaurant on Pennsylvania Ave. at which 120 enthusiastic chemists representing all branches of the rubber industry filled two long tables. Following some interesting professional entertainers, the diners were shown how new members are initiated into the "Razzberry Club" by W. J. Kelly of Goodyear and Winfield Scott of the Rubber Service Laboratories. Verses were sung about each new member and each was dubbed with a humorous title appropriate to the principal interest and activity of the initiate.

Two Committees Report

The report of the Crude Rubber Committee, given on Friday afternoon by Chairman D. F. Cranor, of Binney & Smith, brought forth considerable discussion. In view of the fact that, when appointed, the committee was uninstructed as to its exact scope, the advice of the division as regards future work was requested. It was generally agreed, that crude rubber would be bought on specification some time in the near future and that the committee should investigate crude rubber from this angle, and devote its efforts to general test methods rather than tests for suitability. C. W. Sanderson of the Fisk Rubber Co. discussed his method for determination of rate of cure, and this was accepted for publication by the Society.

Chairman W. W. Vogt of the Physical Testing Committee delivered the report of his Committee, which covered the methods of preparation and testing of experimental compounds by tension tests. No attempt was made by this committee to report on well-known facts or testing methods but rather the report was confined to improvements which might be made in the more important details of testing. The three main heads treated were Milling, Curing and Testing, under which were given the results of numerous tests and recommendations. The report included numerous tables, formulae and charts illustrating the various points brought up.

The next meeting of the Rubber Division will be held at Cornell University on Sept. 8, 1924. Abstracts of some of the papers read are given herewith:

Abstracts of Papers Read

Irene C. Diner.—*A Microscopic Study of Crude Rubber.* This paper is a brief report of a microscopic study of a sample of first latex crepe which after milling was stretched into thin sections. The photographs show the intricate network of cells or vesicles and the effect of strains on the size and arrangement of these cells. The pictures have been taken under different light conditions and depths of focus so as to forestall the implications that they showed only surface phenomena. The effect of staining and of the treatment with carbon tetrachloride, considered as a representative rubber "solvent," are also studied. (Lantern)

Irene C. Diner.—*Notes on the Microscopy of Lithopone.* (Lantern). This paper is a summary of some observations on the structure of the crystals in a collection of lithopone samples and shows the wide variety in structure and in size of crystals, and in the impurities found. It is merely an indication of some factors which may explain the variation in the behavior of different samples of lithopone.

W. M. Weigel.—*Georgia Clays for Rubber Fillers.* (Lantern).

C. W. Bedford.—*Reactions of Accelerators During Vulcanization. VII. Aliphatic Amines and Ammonia.* Sulphur reacts with the amine hydrogen of aliphatic amines, such as piperidine, diethylamine, benzylamine or n-butylamine, to form thiohydroxylamines as the the first intermediate product. In the presence of metallic oxides these thio-hydroxylamines form metallic salts, which in the case of secondary amines are easily isolated. Sulphur easily oxidizes the group =N—SH to n-disulphides, =N—S—S—N=, for secondary amines. These n-disulphides, are also prepared by the action of sulphur chloride on the amine and are direct vulcanizing agents for rubber in absence of free sulphur. Primary amines with sulphur, at low temperatures give the sulphur analogs of the corresponding aliphatic nitro compounds, —NS_2, which are direct vulcanizing agents and may also be prepared by the use of sulphur chloride. These dithionitro derivatives, in their action, are closely related to the vulcanization of rubber by nitro compounds as discovered by Ostronuislenskii. The action of sulphur chloride on aniline at low temperatures has been described as forming the product C_6H_5—NS_2. This sulphur analog of nitro benzene is also a direct vulcanizing agent for rubber in the absence of free sulphur. (Lantern).

H. A. Endres.—*Factors Determining the Reinforcing Value* of Fillers in Compounded Rubber. (Lantern) The factors determining the reinforcing effect which mineral compounding ingredients impart to vulcanized rubber, in the order of their importance, are—

1. Particle size
2. Degree of wetting
3. Particle shape

Particle size is a paramount consideration. By reducing the particle size of a filler its reinforcing effect in a compound is similarly increased. A filler cannot be dispersed in rubber on the mill unless the rubber wets it. Many fillers are badly agglomerated in rubber and this minimizes the physical properties of a stock.

There is no evidence that any differences exist in the strength of the bond between rubber and different fillers except in cases where the fillers are chemically reactive during the cure. So long as the filler is in contact (wet) with the rubber the adhesive force between rubber and filler is determined by the specific surface of the latter. Many fillers impart certain properties to compounded rubber because of their crystalline shape. These properties are manifest even though the filler be completely dispersed and are not obliterated until the particle size is reduced to a state comparable with the finest fillers.

G. S. Whitby and H. E. Simmons.—*Studies of Vulcanization Accelerators, III.* (Lantern) The nickel salts of carbithionic and disubstituted dithiocarbamic acids, although remarkably stable, have practically no accelerating effect either with ZnO or with NiO. Cd and Pb salts are similar in activity to Zn salts when used with ZnO, but Cd salts are somewhat less active when used with CdO, and Pb salts much less active when used with PbO. The effect of certain bases, soaps, and fatty acids on the activity of ultra-accelerators has been examined. In all cases piperidine has a powerful effect. KOH has a much smaller effect. Among substances examined which proved to have little or no accelerating effect may be mentioned—aromatic amides (substituted and unsubstituted). Zn Ph dithiocarbamate, thiuram disulphide, dithiooxamide, ethyl mercaptides.

Stanley Krall.—*The Influence of Organic Accelerators on the Plasticity of Uncured Rubber Stocks.* The majority of

organic accelerators of vulcanization have a softening action on a rubber stock even in the presence of sulphur, provided the compound is mixed at a sufficiently low temperature. However, this softening action is counteracted by a stiffening effect, commonly called "scorching" or "setting up," when the stock is subjected to a temperature of approximately 80 to 100° C.; this range includes the temperatures ordinarily attained in most of the processing operations such as milling, calendering and tubing. The "scorching" tendency was determined by measuring the decrease in plasticity (increase in the plasticity value K) of a stock during a period of heating at a definite temperature. Results are given showing the "scorching" influence of the commonly used organic accelerators including guanidines, aldehyde amine condensation products, thiocarbanilide and p-nitrosodimethylaniline. The influence of the concentration of sulphur and accelerator is demonstrated. The influence of zinc oxide as well as that of inorganic activators such as lime and calcined magnesia, on certain of these accelerators is also shown.

J. M. Bierer and C. C. Davis.—*An Improved Aging Test Involving Oxidation under Pressure.* On the generally accepted theory that the deterioration of rubber is a result of oxidation, the rate and character of aging is a function of time, temperature, and concentration of oxygen. The Geer life test depends for its accelerated rate chiefly upon the temperature factor, and often gives results at variance with natural aging. These discrepancies are overcome in a new test which consists essentially in greatly increasing the oxygen concentration. By submitting rubber to oxygen at high pressure (e.g., 300 lbs. per sq. in.) at 50 to 70° for some hours, deterioration practically identical with several years of natural aging occurs.

A. H. Smith and H. K. Eckert.—*Laboratory Tests of Airbag Compounds.* Sheets of various airbag compounds were subjected to the action of air under 200 lbs. pressure at curing temperatures for varying lengths of time. They were also subjected to overcure by being buried in powdered sulphur it different temperatures for varying periods. The sheets were compared by their resistance to cracking when flexed over curvatures of very small radii. When a bag stock starts cracking, deterioration proceeds much more rapidly than theretofore. Resistance to cracking was therefore taken as a measure of service of the stock rather than the tensile strength.

John B. Tuttle.—*Rubber Compounding for Water Dispersions.* It is pointed out that in the manufacture of rubber articles, by the use of rubber compounds dispersed in water, it is no longer necessary to employ large amounts of soft, low grade, tacky rubbers, oils, etc., to soften the compound to a consistency required for calendering or tubing. A new system of compounding is therefore needed, in which it is feasible to use all high grade rubber, and in which water-soluble substances may be incorporated, if so desired.

John B. Tuttle.—*The Theory of the Aqueous Dispersion of Rubber, and its Effect on our Present Theory of Vulcanization.* According to the theory of aqueous dispersions, rubber exists both in the vulcanized and unvulcanized state, as dispersed rubber particles, with the nonrubber constituents comprising the continuous phase of the mass. By re-hydration, the dispersion as existing in latex can be re-formed by the introduction of a lubricating agent. The various phenomena of calender grain, vulcanization, permanent set, etc., are discussed from this angle.

C. W. Christensen.—*An Effective Inexpensive Safety Device for Laboratory Mills and Calenders.* A very simple, inexpensive and absolutely reliable safety device for stopping laboratory mills and calenders in an emergency is described.

Winslow H. Herschel.—*Method of Determining Consistency of Benzene Solutions of Rubber.* Tests at the Bureau of Standards have shown that, at least in some cases, benzene solutions of rubber are plastic. Consequently it is not possible by the measurement of so-called relative viscosity, as proposed by the Dutch East Indies rubber experiment stations, to identify the consistency of these solutions. It is believed that some instrument should be adopted in which successive trials may be made at different rates of shear, in order that a distinction may be made between viscuous and plastic materials.

Ira Williams.—*Cloudiness of Rubber Cements.* While cements prepared with benzene are transparent, most other solvents produce cements of varying degrees of cloudiness. This cloudiness is due to the protein material in the rubber and can be reduced by controlling the refractive index of the cement. While either gasoline or CS_2 produce cloudy cements mixtures of the two produce a clear cement when the refractive index is 1.51. The refractive index of clear cement varies somewhat when rubber of different botanical origin is used.

E. M. Slocum.—*The Performance of American Peptized Kaolin in Rubber Compounds.* The preparation of peptized kaolins is described. Its reinforcing action in rubber compounds and its comparison with zinc oxide and carbon black in imparting various physical properties to vulcanized rubber is given.

J. Kelley.—*Theories of Vulcanization.* The attempt will be made to show that the phenomena of vulcanization can be satisfactorily explained by consideration of the interfacial energy in the rubber system. This applies not only to rubber alone but also to mixtures containing organic and inorganic accelerators and some of the common compounding ingredients.

Papers Read at Brussels

(Continued from Page 98)

accountancy are still sometimes being relied upon. Without an effective costing system the industry could hardly have succeeded in effecting the substantial economies with which it met the depression of a few years ago.

Attached to the paper is a complete set of estimate forms for use by estate managers. They are intended to illustrate general practice in the industry, and the author frequently refers to them in the course of his remarks. He explains in broad outline the usual system of accountancy followed by rubber companies, and describes the methods adopted to check expenditures in the East, and then proceeds to deal with the method of arriving at costs. This is considered under various headings—class of estate, unit of cost, classification of expenditure, etc.,—and certain controversial matters arising partly in connection with F.O.B. cost and partly in connection with computing the "All In" cost are discussed. In regard to the apportionment of indirect expenditure, or "General Charges," upon which there is a diversity of methods and opinions, the writer says that the two methods most commonly in use are (1) apportionment on basis of wages, and (2) apportionment on basis of acreage, and expresses the opinion that while neither method is strictly scientific the second course provides the sounder basis, as many items included in General Charges have little or no relation to wages at all. But General Charges should not be divided on the assumption that a mature acre carries the same proportion as an immature acre, because the latter demands less supervision, and a unit basis of apportionment as a method of dealing with this is explained.

To arrive at "All In" cost, freight, selling charges, and head office administrative expenses must be added to the F.O.B. cost. The question whether administrative expenses should be allocated as between capital and revenue in respect of properties that are partly mature or immature may fairly be decided by the safe rule that no charge should be made to capital for administrative expenses which would have been equally incurred if there had been no such immature area and would in that case have been charged to revenue. Until producers were agreed upon a common formula for calculating "All In" cost a comparison of costs as between companies and estates must be misleading unless made by competent authorities who have intimate inside knowledge of the methods of calculation. The paper concludes with a few observations on the method by which estate costs may be reduced under severe economic pressure.

TECHNICAL ABSTRACTS

Mechanical **Chemical** **Physical**

A British Process for Rubber Roads

A new patent process for attaching rubber to the road surface, which has lately been demonstrated in London, appears likely to develop into a sound and useful business proposition. The method adopted is that of molding rubber pads onto concrete blocks made of a special mixture. The blocks are 9 in. in length and 4½ in. in depth. In order to prevent skidding the surface of the rubber pads, which are ½ inch in thickness, is embossed. On the under surface are a series of lugs run through by non-resisting wires.

The rubber pads are placed in the molds bottom up instead of being forced into liquid concrete, a sheathing of the liquid concrete then being poured into the molds, thus permeating every crevice without any distortion of the lugs. In order that the blocks shall thoroughly harden a period of 90 days is allowed for this purpose.

Some of these blocks were exhibited and tested at the Roads and Transport Exhibition recently held in London. The tests made were particularly severe. Twelve of the pads were inserted in a block of concrete, three hours only were allowed for settling, then a series of blows was administered to the block by a Johnston tamping machine, which strikes blows of 500 lb. pressure at a rate of 50 to 60 per minute. It required 2,224 blows before the concrete gave way and loosened one of the rubber pads. The pad, however, remained in perfect condition and showed no ill effects whatever from the rough usage to which it had been subjected. All the rest of the blocks were pounded in a similar way during the whole time the exhibition was open without sustaining any damage.

One experiment carried out by request was the crushing of a small piece of concrete, about as large as a hen's egg, on the rubber surface by the same tamping machine. The blow of 500 lb. completely pulverized the concrete but had no effect whatever on the surface of the rubber, which was neither marked nor damaged in any way.

An experimental piece of roadway is now being laid in London to better demonstrate the suitability of the process, the inventors and patentees of which have spent some years experimenting upon it.

Constitution of Vulcanized Rubber

A very interesting article has appeared in the French rubber journal, *Caoutchouc et la Gutta Percha* on the determination of the constitution of the rubber molecule from the manner in which rubber goes into solution and the swelling action that is induced in it when it dissolves. The rather lengthy article is abstracted in the following.

The degree to which rubber can swell in various solvents decreases with the increase in the degree of vulcanization. Rubber vulcanized by heating in solution with sulphur swells to a greater extent in various solvents than does rubber vulcanized to the same coefficient in the usual manner. If the rubber solution is heated before vulcanization, the resulting vulcanized rubber exhibits swelling of still a more marked character. Rubber with 20 per cent of combined sulphur swells but little, whatever the method of vulcanization. From the fact that nitrobenzene swells rubber to a smaller extent than petroleum if the coefficient of vulcanization is low, but at a coefficient of approximately 10, is a more powerful swelling agent than petroleum, it is evident that the distensible constituent in rubber cannot be the same at all degrees of vulcanization. Vulcanized rubber therefore cannot be a mixture of unchanged raw rubber with a sulphur derivative.

A vulcanized gel after treatment with chloroform yields a dry rubber which swells to a less degree than rubber produced from a gel without such treatment. The soluble matter removed contains a slightly lower proportion of combined sulphur than the undissolved residue. Vulcanized rubber therefore consists of two fractions, one soluble and the other insoluble. The rubber functions as a semi-permeable membrane so that a solvent may penetrate and form a solution of the former constituent, but only the less complex molecules can pass into the solvent outside. The soluble and insoluble portions are of closely similar chemical composition, but differ in their state of polymerization.

Vulcanization by Powerful Accelerators

The object of this newly invented process is to avoid the difficulties that are encountered in the vulcanization of rubber batches which contain very powerful accelerating agents. In the new process it is proposed to place alternate layers of rubber containing in one case sulphur and in the other case the accelerator. Then the article formed in this manner is gently heated so as to cause the different vulcanizing agents to diffuse through the rubber mass. Each layer of rubber is about 0.2 of a millimeter thick, but it is possible and practical to vary the thickness of the rubber layers in accordance with the degree of diffusion manifested by the various ingredients of the rubber batch that aid in the vulcanization process. (French Patent No. 544,441.)

Vulcanization and Depolymerization

Mixtures of crepe rubber and varying proportions of sulphur between the limits of half a per cent to twenty per cent, together with one per cent of litharge (A) or one per cent of hexmethylenetetramine (B) or both jointly (C) were vulcanized at a temperature of 32.8 degrees C for periods ranging from fifteen to ninety minutes. These experiments were carried out with the purpose of determining the degree of depolymerization that is produced in the vulcanized rubber.

The mixtures of type C, as the time of vulcanized increased from the lowest to a maximum of thirty minutes, exhibited a decreased tendency to swell in benzene. But as the time of vulcanized was further increased the degree of swelling began to increase, the extent of the "depolymerization" thus indicated being greater the lower the sulphur content of the rubber batch. An analagous inverse relationship was observed between the period of vulcanization and the strength of the vulcanized products that are obtained.

The accelerating effect of the litharge in the mixtures of type A was less than that of the hexamethylenetetramine in the mixtures of type B and still less than the combined action in the mixtures of the type C. The accelerating effect of the use of both litharge and hexamethylenetetramine is greater than the algebraic sum of the effects when these substances are used alone and in the same proportions. It was found that the organic accelerator expedites not only the vulcanization process, but also the subsequent "depolymerization."

The samples of rubber which were vulcanized for the shortest periods, when stored over a period of thirty days, showed an increase in strength which was greater the higher the proportion of sulphur present, the result being due to "after-vulcanization," involving a partial recovery from the previous "depolymerization" effect of hot vulcanization and also a slight decrease in the proportion of combined sulphur. The degree of swelling of rubber in a solvent is distinctly less for a sample vulcanized with the aid of an artificial accelerator than for one vulcanized to the same coefficient without such assistance, the difference being mainly due to the reduction of the period of vulcanization and consequently of the extent of the concurrent thermal "depolymerization." (*Gummi Zeitung*, volume 34, pages 231 to 241.).

RUBBER STATISTICS

Import **Production** **Export**

Imports of Machinery Belting of Rubber and Cotton or other Vegetable Fiber

(Compiled by the Department of Commerce)

	1924					
	January		February		March	
From—	Pounds	Dollars	Pounds	Dollars	Pounds	Dollars
Belgium	979	766	855	671	692	547
France	....	....	25	19	....	....
England	21,471	12,721	33,553	24,299	42,203	27,847
Scotland	20,949	16,317	21,992	16,396	3,660	3,170
Total	43,399	29,804	56,425	41,385	46,555	31,564

March Imports of Crude Rubber, Gutta Percha, and Substitutes

Compiled by the Department of Commerce

Crude Rubber: From—	Pounds	Long Tons	Dollars
Belgium	1,549,535		317,061
France	118,380		25,356
Germany	14,020		2,436
Netherlands	221,208		63,971
England	5,751,791		1,464,450
Canada	744		249
Guatemala	743		113
Nicaragua	7,865		742
Argentina	16,480		4,944
Brazil	2,085,778		419,147
Colombia	9,624		1,581
Ecuador	33,063		7,014
Peru	29,328		5,076
British India	100,812		30,571
Ceylon	5,168,683		1,405,054
Straits Settlements	20,219,852		4,937,398
Other British East Indies	12,320		3,203
China	159,040		40,378
Java and Madura	5,878,687		1,502,033
Other Dutch East Indies	5,056,523		1,407,285
Crude Rubber—Total	46,434,476	20,730	11,638,062
Jelutong or Pontianack	128,018		8,062
Balata	22,279		14,927
Gutta Percha	95,175		14,023
Guayule	....		....
Other crude, scrap and reclaimed	909,769		28,217
Total unmanufactured (including crude rubber total)	47,589,717		11,703,291

	1923 long tons
Total Importations *Crude Rubber* for the month of March	30,929

	1923 long tons	1924 long tons
Total Importations *Crude Rubber* for 3 months ending March 31st	93,493	74,154

Imports of Hard Rubber Goods into the United States

First Three Months, 1924

(Compiled by the Department of Commerce)

	January		February		March	
From	Pounds	Dollars	Pounds	Dollars	Pounds	Dollars
Austria	4,420	4,962	20,790	21,903	24,600	27,796
Czechoslovakia	....	....	124	103	....	....
Germany	11,461	13,065	15,227	18,928	8,411	10,001
Poland and Danzig	2,560	3,611	....	....	....	....
England	60	192	404	243	1,058	944
Canada	....	....	12	44	....	....
Total	18,501	21,830	36,557	41,221	34,069	38,741

Egyptian Cotton Statistics

(Compiled by Alexandria Commercial Co.)

	ACREAGE			
	Sakel. Fed.	Uppers Fed.	Various Fed.	TOTAL Fed.
1923	1.162.036	381.974	44.090	1.588.100
1922	1.357.197	402.724	39.922	1.799.843
1921	995.479	263.050	33.349	1.291.878*
1920	1.270.481	381.518	175.871	1.827.870

† Feddar equals about 1 acre.
* probably incorrect

	Government Estimate Crop		Alex. Gen. Produce Ass. Estimate Crop	
	Preliminary	Final	Preliminary	Final
	Crs.	Crs.	Crs.	Crs.
1923	5.844.000	5.844.000	5.960.000	5.960.000
1922	4.161.000	4.900.000	4.800.000	5.100.000
1921	3.440.000	3.300.000	—	3.450.000
1920	—	6.187.000	6.000.000	6.000.000

Exports of Rubber Goods from U. S.—March, 1924

Compiled from Statistics Furnished by the Department of Commerce

RUBBER BELTING, HOSE, PACKING, AND THREAD.

	Rubber Belting		Rubber Hose		Rubber Packing		Rubber Thread	
	Pounds	Dollars	Pounds	Dollars	Pounds	Dollars	Pounds	Dollars
Totals	311,758	181,005	390,010	155,053	173,069	76,004	90,736	97,524

PNEUMATIC CASINGS AND PNEUMATIC TUBES

	Pneumatic Casings				Pneumatic Tubes			
	For automobiles		Other		Automobiles		Other	
	Number	Dollars	Number	Dollars	Number	Dollars	Pounds	Dollars
Totals	102,240	1,154,201	4,648	21,382	97,338	161,636	2,689	3,125

HARD RUBBER GOODS

	Battery jars and Accessories		Other Electrical Supplies		Other hard rubber goods	
	Pounds	Dollars	Pounds	Dollars	Pounds	Dollars
Totals	59,518	14,711	15,250	10,727	40,445	52,726

WATERPROOFED AUTOCLOTH, RUBBERIZED FABRICS, ETC.

	Waterproofed Autocloth and Rubberizer Fabrics		Waterproofed Clothing	
	Sq. yards	Dollars	Pounds	Dollars
Totals	207,092	132,514	130,720	119,760

SOLID TIRES, ACCESSORIES AND REPAIR MATERIALS

	Solid Tires					
	For Automobiles and Motor Trucks		Other		Accessories and Repair Materials	
	Number	Dollars	Number	Dollars	Pounds	Dollars
Totals	11,247	285,975	117,857	28,304	85,818	37,600

RUBBER FOOTWEAR AND SOLES AND HEELS.

	Boots		Shoes		Canvas shoes with rubber soles		Rubber soles and heels	
	Pairs	Dollars	Pairs	Dollars	Pairs	Dollars	Pounds	Dollars
Totals	19,628	55,088	47,272	38,858	494,019	378,577	221,845	72,116

MARKETS

Cottons and Fabrics

NEW YORK, May 1, 1924.

During the past fortnight talk of a deficient supply of cotton this summer became an important market influence and speculation was rife as to what would happen on the first notice day for May deliveries. This day fell on April 25 in the two big American trading centers, New Orleans and New York. Therefore, the preceding period was characterized by persistent liquidation of the May position, with Southern markets reporting active demand for spots and rumors current of large quantities that had been sold at stiff prices for export. As a result prices eased off considerably in the near months until it became apparent that the local certified stock, less than 15,000 bales, was being shipped for export.

On notice day it was learned that total stock in New York warehouses did not exceed 103,000 bales, which caused a suspicion that certified stock in the Northern market was not as large as had been supposed. It also became known that all available freight room out of the port of New York had been engaged up to the middle of May, and it was admitted that shipments up to that time would probably reduce the certified stock to about 50,000 bales. Considerations of such a sort with an actual tender of only 17,000 bales in the Northern market and no tenders in New Orleans led to a sharp advance on April 25. Although the old-crop positions were influenced entirely by the statistical position, new-crop positions were influenced by improving weather, good progress in planting, and favorable reports from States west of the Mississippi on germination and growth.

Under the combined influence of continued good weather for planting and a weak foreign market, cotton declined 32 to 72 points on the 28th. But late months held and October climbed 15 points during the day. New York market for spot cotton was quiet and declined 70 points to 29.80c for middling upland.

A New York firm with many Southern correspondents estimated the area to be planted this year as 39,200,000 acres over last year, an increase of 4.8 per cent. If such an area is actually planted in the event of normal weather conditions it will represent the largest acreage ever devoted to the cultivation of cotton.

Although cotton recovered from 50 to 75 points on the 29th, a sufficient demand caused most of the gain to disappear toward the close. Reports of less favorable weather West of the Mississippi helped late months. Despite the fact that Liverpool had become steadier before the local market opened, uncertainty due to the Labor Party budget evidently continued a factor in foreign cotton circles. Upon the continuation of demand for old-crop positions, Liverpool, New Orleans and New York advanced. July went as high as 28.27 but closed 27.85 to 27.88.

A good export demand for spinning cotton was indicated by reports that the quantity of middling and strict middling cotton in New York stock has been reduced from 85,000 bales a few months ago to 36,000 bales at this writing.

The activity of cotton mills in March, according to the Department of Commerce, based on spindle activity, was below February and a year ago, spindle hours aggregating 7,073,000,000 in March as against 7,304,000,000 in the preceding month and 9,531,000,000 a year ago. In terms of per cent of mill capacity, reduced to a single-shift basis, March operations were 82.4 per cent of capacity as against 89.8 in February and 108.3 in March, 1923.

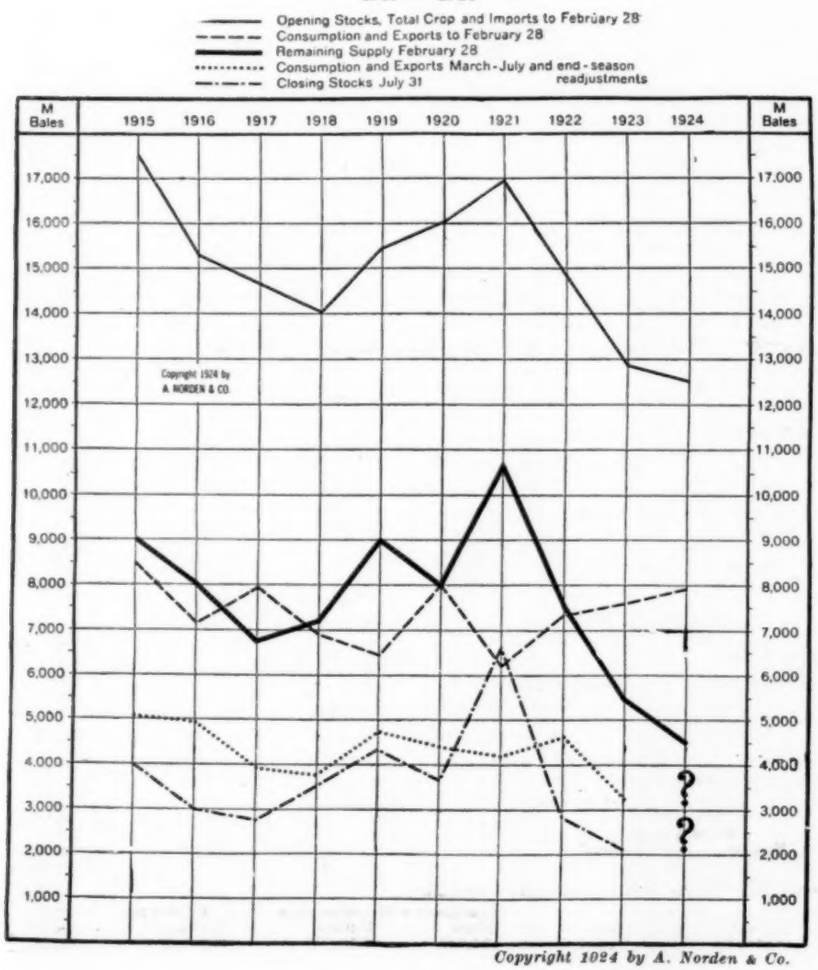
Prices, as of April 30, follow:

	Open.	High.	Low.	Close.	Close April 14
May	29.68	29.75	29.05	29.47	30.87
June	—	—	—	28.98	—
July	27.99	28.07	27.56	27.85	29.30
Aug.	—	—	—	26.60	—
Sept.	—	—	—	25.05	—
Oct.	24.40	24.42	24.09	24.30	25.28
Nov.	—	—	—	23.89	—
Dec.	23.82	23.84	23.55	23.70	24.67
Jan.	23.53	23.53	23.25	23.35	24.34
Feb.	—	—	—	23.40	—
Mar.	—	—	—	23.46	—

(Continued on Page 106)

CENSUS COTTON CONSUMPTION COMPARISONS

February 28
1915 — 1924



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Chemicals and Compounding Ingredients

THE INDUSTRIAL CHEMICAL MARKET—NEW YORK, May 1, 1924—Business in industrial chemicals during the past fortnight has been quiet but fairly satisfactory. Prices are firm with little possibility of any decline in the near future. Stocks in sellers' hands are reported to be about normal. An optimistic tendency is apparent in many quarters where a steady improvement through May is expected. One large factor forecasts considerable activity for the last half of the year. Offerings of compounding ingredients from abroad seem to be on the increase. Generally, volume of business being done is good, with a healthy tone. Consumption of many of the industrial chemicals used in the manufacture of rubber, when compared with consumption of chemicals in the other industries, may be considered as holding up well.

ACCELERATORS

Organic

Aldehyde ammonia, crystals	lb.	$ .90	@	.95
Aniline oil, drums	lb.	.16	@	.18
Diphenylguanidine	lb.	1.05	@	1.15
Excellerex,	lb.	.40	@	.45
Formaldehyde-Aniline	lb.	.47½	@	—
Hexamethylene-tetramine	lb.	.82	@	.85
Paraphenylenediamine	lb.	1.40	@	1.50
Super-Sulphur No. 1	lb.	.50	@	.60
Super-Sulphur No. 2	lb.	.25	@	.35
Tetramethyl—Thiuramdisulphide	lb.	6.00	@	—
Thiocarbanilide, kegs	lb.	.26½	@	—
Vulcocene	lb.	.35	@	—

Inorganic

Lead, sublimed blue	lb.	.09¼	@	—
Lead, white	lb.	.09¾	@	—
Litharge, domestic	lb.	.11½	@	—
Lime, Superfine	lb.	.02	@	.04
Magnesia, calcined, light,	lb.	.24	@	.26
extra light	lb.	.45	@	.60
heavy	lb.	.05	@	.07

COLORS

Blacks

Arrow "Aerfloted"	lb.	.09	@	.10
Bone Black	lb.	.05½	@	.07½
Carbon "	lb.	.09	@	.12
Drop "	lb.	.07½	@	.10
Ivory "	lb.	.15	@	.45
Lamp "	lb.	.12	@	.40
Micronex	lb.	.09	@	.14

Blues

Cobalt	lb.	.21	@	.26
Prussian	lb.	.40	@	.43
Ultramarine	lb.	.12	@	.35

Browns

Iron oxide	lb.	.04½	@	.05½
Sienna, Italian,	lb.	.06	@	.14½
Umber, Turkey,	lb.	.04	@	—
Vandyke, domestic	lb.	.03½	@	.04

Greens

Chrome, light	lb.	.28	@	.31
medium	lb.	.30	@	.35
dark	lb.	.32	@	.42
Commercial	lb.	.12	@	—

Reds

Antimony crimson, 15/17 F.S.	lb.	.39	@	.55
sulphur free	lb.	.45	@	.60
golden, 15/17 F.S.	lb.	.18	@	—
calcium and sulphur free	lb.	.40	@	—
red sulph. 15-17 F.S.	lb.	.15	@	.16
Indian, English	lb.	.11	@	.12
Para toner	lb.	1.00	@	1.10
commercial	lb.	.16	@	.18
Red Oxide, reduced	lb.	.08	@	.12
pure	lb.	.12	@	.14
Toluidine toner	lb.	2.00	@	2.10
Venetian red	lb.	.02	@	.05½
Vermillion, quicksilver, English	lb.	1.22	@	1.25
domestic	lb.	.15	@	.25

Whites

Albalith	lb.	.07	@	.07¼
Aluminum bronze	lb.	.55	@	.60
Lithopone Azolith	lb.	.06¼	@	.06¾
Zinc Oxide—American Process XX red	lb.	.07⅞	@	.08⅛
Kadox, black label, bags, cars		.11¾	@	.12
blue " " "		.10¾	@	.11
red " " "		.09¾	@	.10
American Azo: ZZZ (lead free)	lb.	.07¾	@	.08¼
ZZ (under 5 per cent leaded)	lb.	.07	@	.07½
Z (8-10 per cent leaded)	lb.	.06¾	@	.07¼
Zinc Oxide—French Process White seal	lb.	.12	@	.12½
Green seal	lb.	.10¾	@	.11¼
Red seal	lb.	.09¾	@	.10¼

Yellows

Chrome, light		.18	@	.18½
dark and medium	lb.	.18	@	.18½
Cadmium Sulphide	lb.	1.75	@	2.50
Ocher, French	lb.	.01¾	@	.03
domestic	lb.	.02¼	@	.03

COMPOUNDING INGREDIENTS

Aluminum Flake	ton	25.00	@	40.00
hydrate light	lb.	.17	@	.18
Ammonia carbonate,	lb.	.13	@	.14½
Asbestine	ton	13.50	@	17.00
Barium carbonate,	ton	68.00	@	70.00
Barium Dust	lb.	.05	@	.06
Barytes southern off-color,	ton	15.00	@	18.00
Western prime white	ton	22.00	@	23.00
Imported	ton	28?00	@	33.00
Basofor	lb.	.04¼	@	—
Blanc fixe, dry f.o.b. works	lb.	.04	@	.04½
Carrara filler	lb.	.01½	@	.02
Chalk, precipitated, extra light	lb.	.04¼	@	.05
heavy	lb.	.03¼	@	.04
Clay, China, domestic,	ton	12.00	@	15.00
Dixie	ton	22.00	@	32.00
Blue Ridge	ton	12.00	@	25.00
Fossil flour	lb.	.03	@	.05
Glues, extra white	lb.	.22	@	.30
medium white	lb.	.20	@	.26
cabinet	lb.	.18	@	.28
cabinet low grade	lb.	.15	@	.18
common bone	lb.	.11	@	.15
Graphite flake, bbls.	lb.	.06½	@	.12
amorphous	lb.	.04	@	.10
Infusorial earth, powdered	ton	60.00	@	—
bolted	ton	70.00	@	—
Liquid latex	gal.	1.25	@	1.35
Magnesia, carbonate	lb.	.08¼	@	.08¾
Mica, powdered	lb.	.07	@	.15
Rotten Stone (powdered)	lb.	.02½	@	.04½
Soapstone, powdered	ton	15.00	@	22.00
Starch, powdered	cwt.	3.27	@	3.54
Talc, domestic	ton	15.00	@	22.00
French	ton	20.00	@	25.00
French, high grade	ton	40.00	@	45.00
Italian	ton	50.00	@	55.00
Terra Alba	cwt.	1.75	@	1.90
Tripoli, white	lb.	.02	@	.02¼
Whiting, commercial	cwt.	.85	@	1.15
domestic	cwt.	13.00	@	15.00
gilder's bolted	cwt.	1.10	@	1.20
English cliffstone	cwt.	1.50	@	—
Paris whiteAmerican	cwt.	1.25	@	1.50
Quaker	ton	13.00	@	15.00
Sussex	ton	8.00	@	16.00
Wood pulp XXX	ton	35.00	@	—
" " X	ton	25.00	@	—

MINERAL RUBBER

Genasco (factory)	ton	50.00	@	52.00
Granulated M.R.	ton	50.00	@	54.00
Hard hydrocarbon	ton	30.00	@	40.00
Soft hydrocarbon	ton	30.00	@	40.00
320/340 M. P. hydrocarbon (c. l. factory)	ton	45.00	@	50.00
300/310 M. P. hydrocarbon (c.l. factory)	ton	40.00	@	45.00
Synpro, granulated, M. R. (factory)	ton	55.00	@	70.00

SOFTENERS

Acids

Acetic, 28%	cwt.	3.12	@	3.37
Cresylic, 97%	gal.	.65	@	.75
95%		.63	@	.70
Muriatic, 20%	cwt.	.90	@	1.00
Nitric, 36 degrees	cwt.	4.25	@	4.50
Sulphuric, 60 degrees	ton	10.00	@	12.00
66 degrees	ton	14.00	@	16.00
Tartaric, crystals	lb.	.30	@	—

Alkalies

Caustic soda, 76%	cwt.	3.76	@	3.91
Soda ash, 58%	cwt.	2.04	@	2.19

Oils

Castor, No. 3, bls.	lb.	.15½	@	—
Chinawood, bbls.	lb.	.15	@	—
Corn, crude, bbls	lb.	.11¼	@	—
refined	lb.	.12	@	—
Cottonseed, crude		8.50	@	8.62½
Glycerine,		.17	@	.17½
Linseed, domestic	gal.	.84	@	—
Palm, Niger	lb.	.06½	@	.06¾
Lagos	lb.	.07½	@	.08
Peanut, domestic, crude	lb.	.12½	@	—
Petroleum, amber	lb.	.04¾	@	—
dark, amber	lb.	.04½	@	—
Pine, steam distilled	lb.	.62	@	.63
Rapeseed, refined	gal.	.90	@	.92
blown	gal.	1.05	@	—
Rosin, first rectified	gal.	.42	@	.44
second refined	gal.	.45	@	.47
Soya Bean		.11¾	@	—
Tar, commercial	gal.	.30	@	.32

Resins and Pitches

Cumar resin, hard	lb.	.09	@	.10
soft	lb.	.09	@	.10
Parra M.R.	lb.	.06	@	.07
Tar Retort	bbl.	11.00	@	—
kiln burned	bbl.	11.00	@	—
Pitch, Burgundy	lb.	.05	@	.06
coal tar	gal.	.06	@	.08
pine	bbl.	6.50	@	—
Rosin, grade K	bbl.	5.70	@	5.75
Shellac, fine orange	lb.	.60	@	.61

Solvents

Acetone, drums	lb.	.15	@	—
Alcohol, denatured, No. 1 bbls.	gal.	.52½	@	.56½
Benzol, 90%	gal.	.23	@	.30
pure		.24	@	.31
Carbon bisulphide	lb.	.06	@	.07
tetrachloride	lb.	.07½	@	.08½
Dimethylaniline	lb.	.39	@	.41
Motor gasoline, steel bbls.	gal.	.20	@	—
Naptha, V. M. & P.	gal.	.18	@	—
Toluene	gal.	.26	@	.31
Turpentine, spirits	gal.	1.01	@	—
wood	gal.	.90	@	—

Waxes

Bayberry	lb.	.21	@	.22
Beeswax	lb.	.40	@	.42
Carnauba, No. 1	lb.	.38	@	.39
Ceresin, white	lb.	.09	@	.10
Montan, crude	lb.	.05½	@	.06
Ozokerite, black	lb.	.23	@	.24
green	lb.	.27	@	.28
Paraffine	lb.	.05¾	@	.05⅞
Sweet wax	lb.	.12	@	—

SUBSTITUTES

Black	lb.	.09	@	.14
White	lb.	.10	@	.16
Brown	lb.	.10	@	.15
Brown factice	lb.	.09	@	.16
White factice	lb.	.08½	@	.15

VULCANIZING INGREDIENTS

Black hyposulphite	lb.	.17	@	.20
Sulphur Chloride (drums)	lb.	.06	@	.08
Sulphur flour Commercial bags,	cwt.	1.35	@	1.70
" bbls.	cwt.	1.70	@	—
Superfine, bags,	cwt.	2.00	@	2.40
" bbls.	cwt.	2.40	@	—
100% pure, refined, bags	cwt.	2.35	@	—
bbls.	cwt.	2.60	@	—

Crude Rubber

NEW YORK, May 1, 1924

The market seemed in no mood for business through the Easter season and little change took place in quotations for several days. The New York market was closed on Good Friday and few traders were on hand to transact business the following day. The London market closed from April 18th until the 22nd, and Singapore, Colombo and other Far Eastern rubber markets followed suit.

March shipments of all grades of rubber from Singapore totaled 22,293 tons which brought the aggregate for the first quarter up to 65,536 tons. The market on the 21st was quiet and few traders were willing to do business at the prices quoted. July-September was quoted at 22 7/8c. The statistical position was again problematical when it was reported that several steamers from the Far East would arrive at the end of the month. An unexpected advance of 3/8d a pound in the London market became the feature of trading in New York on the 23d. It was reported that large interests were buying all offers in London in order to have rubber well under control when the Stevenson Committee meets to set a new exportable allowance figure to replace the 60 per cent.

Prices were fairly firm until the 25th when every position except April deliveries declined. A partial explanation of this condition was the rejection of a large consignment from the East which materially reduced the spot supply and sent the price to 23 1/4c. May position attracted interest during the day and closed firmly at 23c, in comparison to the same position in London which closed easy. In sympathy with a loss of 1/8d in the whole list in London, Singapore lost 1/8d.

On the 26th a cable from Amsterdam bore the news of the formation of a new rubber trading company there, capitalized at 1,500,000 florins by American, British and Dutch interests. The opinion was held by some that the organization of this company, the name of which was not divulged, was a compromise that followed Dutch rejection of the Stevenson plan.

On the 28th the market started a new week in an uncertain fashion. Nearby positions were off slightly to an asking basis of 23 1/4c for April and 23 1/8c for May. It seemed that the steadiness in London and the high prices in Singapore were ignored in New York where efforts were being made to dispose of stocks held for a rise but which could not be sold to manufacturers until January, February and March arrivals had been consumed.

Pessimism was rampant on the eve of the meeting of the Stevenson Committee. Prices not only went lower on all positions but the premium on April was wiped out when one or two large factors decided to liquidate. London was also dull and slightly lower prices were quoted on all positions. Singapore was steady, advanced slightly on forwards, and a little more active in speculative covering.

When the Stevenson Committee met on the 30th they did not change the exportable allowance figure of 60 per cent. This action had a weakening influence on the market and prices lost from 1/2 to 5/8c a pound on all positions. Spot ribbed smoked sheets, April and May deliveries, were offered at the close as low as 22 1/2c and the forward positions of July-September and October-December were quoted at 22 7/8c and 23 1/2c, respectively. Buyers centered their interest in April and May spots and bought at the lows. Interest was also manifested in Paras, and some business was done in June arrivals of rolled brown crepe at 21 7/8c, in up-river fine at 20 3/4c, and in clean thin at 22 1/4c. Prices in London lost 1/4d and 3/8d in weak market, which, however was a litle firmer at the close. Singapore was quiet and showed an easy inclination.

Quotations are nominally as follows:

NEW YORK MARKET

Plantations—			
Ribbed Smoked Sheets:			
Spot	.22 5/8	@	—
May	.22 5/8	@	—
June	.22 3/4	@	—
July-September	.23	@	—
First Latex, crepe, spot	.23 1/2	@	—
Amber Crepe No. 1, spot	.22 1/2	@	—
" " No. 2,	.22	@	—
" " No. 3,	.22 1/4	@	—
" " No. 4,	.21 3/4	@	—
Brown Crepe, Rolled	.21 5/8	@	—
" " Clean, thin	.21 5/8	@	—
" " Specky	.21 7/8	@	—
Scrap, Colombo No. 1	.17	@	—
Pontianac—			
Prime Pressed	.13	@	—
Palembang	.13 1/8	@	—
Bangermassin	.09	@	—
Sarawak	.07 3/4	@	—
Paras—			
Up-river Fine	.21	@	—
" Medium	.18 1/8	@	—
" Coarse	.16	@	—
Islands, fine	.17 1/8	@	—
" medium	.15	@	—
" coarse	.11 1/2	@	—
Cameta	.11 1/2	@	—
Madeira Fine	.22 1/4	@	—
Acre Bolivian, fine	.21 1/4	@	—
Cut Beni Bolivian, fine	.22	@	—
Tapajos, fine	.19 1/2	@	—
Xingu Ball	.16	@	—
Caucho Ball—			
Upper, shipment	.16 1/2	@	—
Centrals—			
Central, scrap, prime	.16	@	—
Corinto, scrap	.16 1/2	@	—
Esmeralda, sausage	.16 1/2	@	—
Benezuela, No. 1	.13	@	—
" No. 2	.11 3/4	@	—
Congo, upper, black	.20	@	—
" red	.20	@	—
Kassai, Prime Red	.18	@	—
Balata—			
Black, Columbia	.54	@	.56
" Cuidad	.65	@	—
Surinam, sheet	.73	@	.74
Gutta Percha—			
Siak	.16	@	.16 1/2
Red Macassar	2.80	@	3.00
Chicle—			
Guayule, w and d.	.24	@	—
Africans—			
Mexican, Yucatan	.65	@	.67

LONDON MARKET

Standard Ribbed Smoked Sheets—	
Spot	11 3/4 d
May	12 1/4
June	12 3/8
July	12 1/2
July-Sept.	12 5/8
Oct.-Dec.	12 7/8

SINGAPORE MARKET

Standard Ribbed Smoked Sheets—	
Spot	12 1/4 d
June	12 5/8
July	12 1/2
July-Sept.	12 5/8
Oct.-Dec.	12 1/8

Chemicals

Carbon Black—A report of a possible shortage this summer has given some impetus to the market. It is reported that buyers are considering orders for fairly large quantities. Quotations show little change.

Blanc Fixe—Factors report an active market for small lots for immediate consumption. Prices are steady.

Caustic Soda—A decrease in the volume of goods moving was noted but the movement was not sufficient to effect the accumulation of stocks to any great degree. Prices are firm due to manufacturing costs.

Sulphuric Acid—A limited demand caused the accumulation of heavy stocks, and, although withdrawals were good but made no great effect on stocks. Quotations, however, are practically unchanged.

Reclaimed Rubber

NEW YORK, May 1, 1924

Few new orders are reported by reclaimers. A fairly satisfactory volume of business, nevertheless, is being done on old contracts, and reclaimers are still optimistic regarding future business. The entrance of a few new manufacturers into balloon tire production and the volume of orders being placed for rubber heels have probably much to do with this attitude. Quotations are nominally as follows:

Floating Tube	.13 1/2	@	.14
Friction	.21	@	.22
Boots and Shoes (unwashed)	.09 1/2	@	.09 3/4
Boots and Shoes (washed)	.12 1/2	@	.13
Mechanical	.09	@	.09 1/2
Hose	.09 1/2	@	.10
Tires, truck	.08	@	.08 1/4
Tires, auto, black	.08 3/4	@	.09
Black (washed)	.10 1/2	@	.10 3/4
White	.15	@	.15 1/4
Dark Gray	.09 3/4	@	.10
Light Gray	.11	@	.11 1/4

Scrap Rubber

NEW YORK, May 1, 1924

The market for scrap rubber continues quiet. Little business, except on old contracts, is reported by dealers. A pessimisite tendency is still apparent and no change is expected until the fall. Quotations are easier in most grades. However, these are not expected to show further declines. Prices are nominally as follows:

Auto tire peelings	.00 1/2	@	.00 5/8
Standard White auto ton	13.00	@	14.00
Mixed auto ton	9.00	@	10.00
Bicycle tires ton	6.00	@	7.00
Clean solid truck tires	.00 1/2	@	.00 5/8
Boots and shoes	—	@	—
Arctics, untrimmed	.00 7/8	@	.01
Arctics, trimmed	.01 1/4	@	.01 1/2
Inner tubes, No. 1	.03 3/8	@	.03 1/2
Inner tubes, compounded	.01 3/4	@	.02
Inner tubes, red	.01 3/4	@	.01 7/8
Battery jars, clean hard rubber	.00 7/8	@	.01
Air Brake Hose ton	10.00	@	11.00
Rubber Hose ton	7.00	@	8.00
Red packing	.01	@	—

Cottons and Fabrics

(Continued from Page 103)

EXTRA STAPLE COTTON

Since our last report all grades in thsi market have declined. Prices on extra staple cotton, strict middling in grade and color, f.o.b., New Bedford, were quoted April 30 as follows:

1 1-8 inch, 32½ @ — cents.
1 3-16 inch, 33 @ 34 cents.
1 1-4 inch, 34 @ — cents.
1 5-16 inch, 34¾ @ — cents.

TIRE FABRICS

The demand for longer staples had a tendency to move the market to a situation that prevailed about two years ago when experiments failed to determine just what cotton was best suited to the economical production of a balanced tire. There was also an increased tendency apparent to diversify the construction of fabrics, which brought a demand for stronger cotton fibers, including Arizonas, Egyptian uppers and Sakelerides. Although somewhat less stabilized than at this time a year ago, conditions in the tire fabric market are more stabilized than those prevailing in the other cotton sections.

During the past two weeks consumer requirements reflected increased shipments to tire dealers. It is estimated that there were half a million more tires in stock at the beginning of April than at the beginning of March. Competition is now so keen that mill men offer tire fabrics at prices not greatly affected by cotton positions. Mills continue to go after business in a hectic fashion in an effort to keep sufficient business on the books to operate at a profit sufficient to pay overhead expenses. Price advances in the cotton market do not always cause fabric quotations of all mills to advance because there are always a few who are only too willing to sign contracts based on old prices. In some quarters a bad year is predicted for fabric mills.

CORD FABRICS

Combed Sakellarides		Nominal	
Combed Peeler	lb.	Nominal	
Carded Peeler	lb.	.56 @	.58
Combed Egyptian uppers	lb.	Nominal	
Carded Egyptian uppers	lb.	.63 @	.64

SQUARE WOVEN

17½-ounce Egyptian uppers, combed	lb.	Nominal	
17¼-ounce Egyptian uppers, carded	lb.	.61 @	.63
17¼-ounce Sakellarides, combed	lb.	Nominal	
17¼-ounce Peeler, combed	lb.	Nominal	

Ducks—Inquiries continue, especially for small lots of spot cotton duck, a number of which developed into sales. But fewer and smaller orders have been reported for the past two weeks. Although small orders are being received steadily, volume of business done could not be called satisfactory. However, when compared with the situation a month ago, a slight improvement is apparent. Export business is an outstanding consideration because of the uncertain condition of the market.

Burlaps—Price advances in Calcutta have been offset by a fall in Sterling during the past two weeks. Daylight saving has brought in Calcutta cables an hour later, thus limiting the working day of factors. Quotations show more stability than at this time a year ago. More interest is being manifested in spot and afloat heavies. Toward the close of this period business was reported in fairly satisfactory volume.

SHEETINGS

40-inch 2.50-yard	yd.	.16½ @	—
40-inch 2.85-yard	yd.	.14 @	.14¼
40-inch 3.15-yard	yd.	.14¼ @	—
40-inch 3.60-yard	yd.	.12 @	.12¼
40-inch 3.75-yard	yd.	.11 @	—
40-inch 4.25-yard	yd.	.10 @	—

DUCKS

Belting	lb.	.44 @	.46
Hose	lb.	.44 @	.46
Enameling	lb.	.46 @	.49
Shoe Ducks	lb.	.48 @	.52
Single filling	lb.	.21½ @	.23
Double filling	lb.	.23 @	.25

BURLAPS
(Carload Lots)

7½-ounce 40-inch		5.60 @	5.65
8 -ounce 40-inch		5.75 @	5.80
10 -ounce 40-inch		7.45 @	7.50
10½-ounce 40-inch		7.50 @	7.60

DRILLS

37-inch 2.75-yard	yd.	.14¼ @	—
37-inch 3..00-yard	yd.	.13¾ @	—
37-inch 3.25-yard	yd.	.12¾ @	—
37-inch 3.50-yard	yd.	.12 @	.12¼
37-inch 3.95-yard	yd.	.10½ @	—

OSNABURGS

30-inch 7-ounce		.15 @	—
40-inch 7-ounce		.16¼ @	.16¾

New Incorporations

CONNECTICUT

O'Brien & Scheyd, Inc., Hartford, Conn. $50,000. Tire and rubber goods business. Incorporators: August Scheyd, New Britain; Albert J. Wurtz, Hartford; and Hugh J. O'Brien, East Hartford.

Connecticut Rubber Co. $300,000. Incorporators: James J. Hoctor, John T. Mahoney, both of Fall River, Mass.; and Maurice A. Long, Brockton, Mass.

DELAWARE

Imperial Rubber Corporation. $150,000. Incorporator: M. M. Lucey. Principal office, Wilmington, Del.

DISTRICT OF COLUMBIA

McLane Tire & Rubber Co. $100,000. Incorporators: Hugh M. Sterling, Frank Arnold, Joseph A. McLane, Henry A. Baker, Charles L. Morris, all of Washington. Principal office, Washington, D. C.

MASSACHUSETTS

Consolidated Rubber Company. $200,000. Cement, rubber goods, compounds. Incorporators: Alexander Gibbons, Allston; James A. Dever, Providence; Frank J. Broderick, Manchester; N. H. Principal office, Boston, Mass.

NEW JERSEY

Uniflex Rubber Company. $125,000. Molded rubber goods and plumbers' supplies. Principal office, 40 Paterson Ave., East Rutherford, N. J.

Rubber-on-Metal Welding Corp. $100,000. Metal and rubber products. Principal office, 15 Exchange Place, Jersey City, N. J.

NEW YORK

Daylight Rubber Co. $5,000. Incorporators: A. Handschuh, J. Handschuh and H. Handschuh Principal office, Brooklyn, N. Y.

OHIO

Guarantee Tire & Vulcanizing Co. $1,000. Incorporators: Arthur Krause and A. Barbian. Principal office, Cleveland, Ohio.

Durable Balloon Tire Co. $1,000. Incorporators: G. W. Panceast, G. E. Buckingham, Jr.; G. E. Buckingham, Sr., S. E. Conner, and M. E. Conner. Principal office, Akron, Ohio.

TEXAS

Seiberling Rubber Co., Akron, Ohio. Capital stock $10,000. Texas headquarters at Dallas. W. H. Ector, state agent.

WASHINGTON

Northern Tire Co., Inc. $10,000. Incorporators: W. J. Woempner, Edith M. Woempner. Principal office, Seattle, Wash.

Trade Marks

APRIL 15, 1924

THERMATOMIC (with design)—No. 167,907. Thermatomic Carbon Co., Pittsburgh, Pa. Rubber belting, rubber hose, rubber machinery packing, and rubber tires.

GRAMWILL RUBBABUBBLES—No. 173,965. W. G. Ingram, Jr., London, Eng. Confection consisting of a hollow tube of licorice with a rubber balloon attached thereto.

RADIO—No. 191,464. American Hard Rubber Co., Hempstead and New York, N. Y. Hard rubber combs for dressing, ornamenting and cleaning the hair.

STYLUS—No. 191,465. American Hard Rubber Co., Hempstead and New York, N. Y. Hard rubber combs for dressing, ornamenting and cleaning the hair.

TRIUMPH—No. 191,466. American Hard Rubber Co., Hempstead and New York, N. Y. Hard rubber combs for dressing, ornamenting and cleaning the hair.

ATHLETE—No. 191,468. American Hard Rubber Co., Hempstead and New York, N. Y. Hard rubber combs for dressing, ornamenting and cleaning the hair.

ESMERALDA—No. 191,735. American Hard Rubber Co., Hempstead and New York, N. Y. Hard rubber combs for dressing, ornamenting and cleaning the hair.

FLEXOR—No. 191,736. American Hard Rubber Co., Hempstead and New York, N. Y. Hard rubber combs for dressing, ornamenting and cleaning the hair.

ADMIRATION—No. 191,862. American Hard Rubber Co., Hempstead and New York, N. Y. Hard rubber combs for dressing, ornamenting and cleaning the hair.

AUTOMOBILE—No. 191,864. American Hard Rubber Co., Hempstead and New York, N. Y. Hard rubber combs for dressing, ornamenting and cleaning the hair.

PENNANT—No. 191,865. American Hard Rubber Co., Hempstead and New York, N. Y. Hard rubber combs for dressing, ornamenting and cleaning the hair.

TUXEDO—No. 191,866. American Hard Rubber Co., Hempstead and New York, N. Y. Hard rubber combs for dressing, ornamenting and cleaning the hair.

ADMIRAL—No. 192,951. American Hard Rubber Co., Hempstead and New York, N. Y. Hard rubber combs for dressing, ornamenting and cleaning the hair.

(Not subject to opposition)

LEXINGTON—No. 182,858. The National Tire & Rubber Co., East Palestine, Ohio. Rubber tires and tubes.

RESISTOIL—No. 182,876. Brunner Manufacturing Co., Utica, N. Y. Rubber hose.

GLADSTONE (carried in a design)—No. 182,895. Harry D. Gladstone, doing business as Gladstone Tyre & Supply Co., New York, N. Y. Tires, tubes and casings.

APRIL 22, 1924

Subject to opposition within 30 days of above date

DESIGN (containing the words Sacks Standwear Shoes in a square)—No. 164,775. Jacob Sacks, doing business as Jac. Sacks, Jersey City, N. J. Shoes manufactured from leather, rubber, etc. and combinations.

KASUNDA.A (in design)—No. 168,902. Wallace A. Robb, Syracuse, N. Y., assignor to Kasunda Supply Co., Inc., Syracuse, N. Y. Mill supplies, namely canvas, rubber, etc. belting; shock absorbers composed of rubber.

EMSCO—No. 190,362. E. M. Smith Co., Los Angeles, Cal. Brake lining, machinery packing, and hose and belting of rubber and fabric; rubber valves, rubber spiral packing, rubber sheet packing, rubber piston sleeves, packing-head rubbers, blow-out preventer rubbers, etc.

FALCO—No. 191,011. Foster-Alexander Corp., Birmingham, Ala. Leather, cotton, duck, or rubber belting and combinations of same; asbestos, rubber, or cotton duck and combinations of rubber and cotton duck packing; and rubber hose.

WHITE DIAMOND (contained in a horizontal diamond under three x's)—No. 192,983. Matchless Metal Polish Co., Chicago, Ill., and Glen Ridge, N. J. Buffing and polishing compound in cake form for metals, hard rubber and celluloid.

Not subject to opposition

THE NEW HUDSON CORD (followed by horizontal triangle containing the words "New Hudson")—No. 183,262. Hudson Tire Co., Inc., Newark, N. J. Rubber tires.

EVER STRETCH—No. 183,267. Wm B. Bliss Jr. & Co., New York, N. Y., assignor to Wm. B. Bliss & Co., Inc., New York, N. Y. Narrow elastic.